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THE STATEMENTS in the daily press that oil for fuel purposes has been offered at 2½ cents per barrel in the Beaumont, Texas, field, should not be taken seriously. Most of the oil produced in Texas is being delivered on contracts extending over long periods of time, and at much higher rates than that named. The prices quoted above were intended to relieve a few small holders from temporary embarassment and have no influence on the general price for the field.

⚒

THE GOLD exports to France, which are now being made, and which are explained in our financial column, are attracting much more attention than their importance deserves. It should be remembered that after all their gross amount is trifling in comparison with our current production, and that our gold holdings in this country are not only the largest ever recorded, but are of so great an amount that the commercial world now naturally looks to this country as a source of supply when gold is needed at any special point. Our financial notes also show, in this issue, the receipts of more than corresponding amounts from Australia and Japan.

⚒

IT IS a decided compliment to our mining news correspondents when their letters to the ENGINEERING AND MINING JOURNAL are copied in papers published on the spot; showing that our representatives give the earliest and best information of events in their local mining world. We are always pleased to have these items so copied, but we think that the contemporaries who thus show their appreciation owe us at least the courtesy of an acknowledgment. We do not at all object to the reproduction of articles or items from our columns, when accompanied by the proper credit; but we must insist that such credit is due to the JORNAL and its contributors. We trust that this notice will be sufficient.

⚒

THE article on another page, which we are permitted to present through the courtesy of the Governor of Cuba, contains valuable study of the iron ores of the Santiago District. These deposits are of some present importance to our iron industry and may be of much greater importance in the future, so that the study will be of interest to many. There is little doubt that Cuba will furnish large supplies of iron ore hereafter, and the location of these ores makes it possible to deliver them to furnaces on or near the Atlantic seaboard at a moderate cost for freight. They may take a prominent part in the future development of Cuba, besides assisting the iron industry of the Eastern States to maintain its position.

⚒

A BOOM in coal lands is reported from West Virginia, where buyers are actively searching for options and contracts on property in the Tug River and other fields. This is largely due to the transfers recently made in the Pocahontas field, partly because the magnitude of those transactions has put a premium on coal property, and partly because many of those operators who have sold out their holdings are looking for investments in adjoining fields. The boom is not only enhancing the present value of West Virginia lands, but its effects are extending into Eastern Kentucky. As in all such cases, there is not too much discrimination in buying, and lands of very doubtful value, as far as coal is concerned, are being taken up in the rush.

THE LETTER which we publish in an another column from the Consolidated Schools of New York explains the responsibility which that organization has assumed with relation to those who subscribed to, or paid for instruction from, the late United Correspondence Schools. We are informed that the new organization is in capable hands and proposes to carry on its work under careful management.

We make this statement in response to numerous letters and inquiries which we have received; but it should be understood that the ENGINEERING AND MINING JOURNAL has not now—and has not had at any time—any connection with or responsibility for the United Correspondence Schools, as some of our correspondents seem to have assumed.

⚒

THE HEAVY speculation in Rio Tinto Copper shares in the European exchanges seems to have nearly closed, and sales of these shares in Berlin and Paris have decreased considerably in amount, according to the latest accounts received. In all, at least 50,000 shares changed hands on the deal. All the shares offered were promptly taken up in a way which suggested buying from a single source, and reports were very generally current abroad that the stock was taken for American account. While it is impossible to obtain confirmation of these reports here, it is not an unnatural supposition that there may be some foundation for them. The advantages which would accrue to the managers of the Amalgamated Company from a control of the largest European copper producer are evident, and we may presume that an opportunity for acquiring such control—or at least a voice in the management—would not be neglected.

⚒

METALS WANTED IN THE UNITED STATES

Platinum in place in the State of Washington is briefly announced in another column. The specimens were sent in to the Geological Survey in response to their publications describing the conditions under which platinum ledges might profitably be sought.

Nickel, chromium and platinum are needed in the United States. The conditions of occurrence are being investigated more carefully than at any recent time. It chances that all three metals are sought in the same rocks—altered eruptives rich in magnesium.

No less than four new sources of nickel have been recorded in the last few months, and in one—in Nevada—nickel, platinum and copper are all reported, making profitable extraction possible with only a small percentage of nickel. Chromium ores require, on the other hand, 50 per cent or more of chromic oxide to make the ore profitable for bichromate manufacture.

The zealous search for platinum in the past three years has revealed traces of it in most unexpected quarters, such as eastern Pennsylvania, and in North Carolina as a mineral curiosity. It has been found in hundreds of placer gold mines in California, Oregon and British Columbia, in sufficient quantities to place the United States above South America as a source for this precious metal and probably next to Russia—if the gold miner can be induced to abandon his prejudice for the yellow metal and save the platinum with it. This does not seem difficult, especially with the latter equal to gold in price; but nevertheless great quantities of platinum and its allied metals, osmium and iridium, have been thrown away.

It may be doubted whether the newly discovered platinum "in place" will prove rich enough for profit, but the attention which it draws to the metal will aid the industry.

THE ISSUE OF ENGLISH COMPANIES' SHARES AT A DISCOUNT

In our issue of November 9, our London correspondent called attention to a case of what is practically issuing shares of an English company at a discount. A mining company was advertising in London the issue of 80,000 new shares at the par value, £1, but mentioned that all subscribers would immediately be given a cash commission of 40 per cent, amounting to an immediate return of 8 shillings per share. The actual price of issue thus became 12 shillings per share. As it has always been the law in England that the shares of limited liability companies shall not be offered at a discount, the issue in question naturally has raised considerable discussion. It appears that the issue has been made in accordance with a section of the Companies Act of 1900 relating to the disclosures of underwriting commissions in the prospectus of a company. The section says: "Upon any offer of shares to the public for subscription, it shall be lawful for a company to pay a commission to any person in consideration of his subscribing or agreeing to subscribe, whether absolutely or conditionally, for any shares in the company or procuring or agreeing to procure subscriptions whether absolute or conditional for any shares of the company if the payment of the commission and the amount or rate per cent of the commission paid or agreed to be paid are respectively authorized by the articles of association and disclosed in the prospectus and the commission paid or agreed to be paid does not exceed the amount or rate so authorized."

This section, as already mentioned, was really intended to apply to underwriting agreements and to the payment of commissions to financial agents for placing shares. But there is nothing in the wording to prevent its application also to the payment of commissions large or small to the actual subscribers. It covers even the limiting case of paying a commission of 19s. 11d. to subscribers of £1 shares, an operation which is equivalent to the issue of £1 shares at one penny. The limitations to the possibility of this policy are the disclosure of the fact in the prospectus and the provision for such a policy in the articles of association, which, in other words, are the rules of management. The articles are originally fixed by the promoters and are subsequently under the control of a three-quarters majority of the shareholders, so that if the promoters and shareholders generally agree to the policy of issuing shares at a discount in this way there appears to be nothing to prevent them from doing so. The English company law has always been different from United States law on this point, but it is not necessary to discuss their respective merits here. It may be added that many incongruities in English laws, of which this is an example, are due to the way in which acts are drafted and discussed. In the present case the need for a new act had been known for a long time and a committee had sat for some time hearing propositions and objections. The final passage of the act was, however, effected in a great hurry at the end of a session, and little time or thought was given to the actual significance of the wording or the ultimate effects of various amendments. To this is doubtless due the clause above referred to.

⚒

MARKET CONDITIONS

Very little change is to be noted in the copper market, prices continuing firm, while inquiry for export is improving slightly. As for several months past, the domestic consumption is enormous, and in some cases, consumers are actually pressing for deliveries. A recent careful estimate shows that the consumption of the wire manufacturers and brass founders for the first half of the current year exceeded that of any similar period in the history of the trade, and making allowances for railroad and other demands, it is probable that the falling off in exports this year has been fully made up by consumption in the United States

In other metals, the only notable change is a sharp turn in tin, chiefly due to speculation in London. While the demand here for tin continues very good, there is a little hesitation about laying in supplies, and sales have been chiefly for immediate delivery. Lead continues without change. The activity in spelter continues, both galvanizers and brass manufacturers being steadily in the market for supplies. Abroad, the proposed convention among the European zinc smelters continues to be discussed, but no action has been taken. The foreign trade is for the present relieved from competition with American spelter, which is not now going forward in any quantity, but the demand from consumers continues very light, and the trade in Silesia is in an extremely unsatisfactory condition. The latest quotations for Silesian spelter delivered on cars at Breslau are over half a cent below the New York prices.

Silver shows little change, and the demand from the East continues light. Chinese trade remains in an unsatisfactory condition, and the demand for Indian account is temporarily small. While stocks in London are said to be somewhat larger than usual, we are assured that there are no accumulations of the metal here.

In the iron and steel trade, reports are unchanged. We are now producing pig iron at the rate of nearly 17,000,000 tons a year, the highest figure ever reported. Nevertheless, unsold stocks have actually decreased, and furnaces are being pressed for delivery. With steel billets, the case is very much the same, the mills being unable to supply material as fast as wanted. There are again reports that some German basic steel has been sold here at a price said to be equivalent to about $29, New York. For finished materials demand continues strong, and in structural material especially, buyers are urging deliveries. Some further orders for steel rails are reported, and in almost every line new business is satisfactory. There have been suggestions of an increase in prices, but the leading producer seems to be unwilling to check consumption by an advance, and this policy is generally regarded as a wise one by the trade.

The coal trade in the East, both anthracite and bituminous shows continued activity, and production is steadily absorbed. The chief trouble at present is in the supply of cars at the mines, which is seriously retarding deliveries. This car trouble is also affecting the trade in the West, and it seems to be impossible to get coal to the lake ports fast enough to fill contracts for shipping before the close of navigation, which will result in some inconvenience at Northwestern points.

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THE CHINESE RAILWAY POLICY.

The while world is looking with interest to see what course the development of China will have after the great upturning of last year. We hear of edicts for the introduction of schools of "Western" knowledge and there is no doubt that China contains a small body of men, luckily among the influential class, who understand the importance of changing the ancient useless learning for the more fruitful studies of modern life. The subject is of interest to readers of the ENGINEERING AND MINING JOURNAL because mining is the particular form of civilized activity to which the Chinese are looking most earnestly. Ship-building, gun-making and railroads are, we believe, about the only other foreign industries which have been introduced, the few silk filatures of Shanghai and other places being ventures of foreign residents in which the natives have little interest. The first admission of foreign management was to the coal mines of Tong Shan, or Kaiping, and the excuse for the innovation was the necessity of obtaining fuel for the Northern Fleet of the Navy. The next was a private venture in the gold mines of Shantung and the third the introduction of American methods at Ku Shan Tzu in Mongolia. This had its origin in an edict of the Empress requiring the viceroys to encourage copper mining for the purpose of providing metal for the projected reform of the currency. There was no copper in the mine, but that is another story. Next followed the steel works opposite Hankow.

The most important of these enterprises in Chinese eyes, the one they look to as a political and industrial necessity, is the steel works, for after years of conference with foreigners from every country it was decided by several influential viceroys that vigorous railway building should be postponed until the rails could be made from Chinese ores. The economical reason for this decision was that the cost of the rails would be too great a drain upon the Empire if the sums required were sent to another country. It was common for foreigners to advise making what they called a light start, say 1,000 miles of road with foreign rails. To the Chinese this looked stupendous and they shrank from raising taxes in silver to pay such bills in gold.

The result of the discussion was a step which may become notable historically, because it was the first time the Chinese Government took a favorable stand on the great question of foreign industries. Hitherto all such questions had been treated as too ignoble for consideration by the Son of Heaven and were left to private adventurers, but the certainty that railroads would be built and would affect profoundly the welfare of the whole Empire brought the highest officials into the discussion of this subject. The result was a conclusion that may one day be quoted as the first declaration of an industrial policy in the new life of China. It was—"No railroads except from Chinese ores by Chinese labor." The cry was popular among all the influential class of China. It is the commercial policy to which all nations are striving and is sound and patriotic. How to carry it out was the question. Two millions of taels a year, then worth about $2,500,000 gold, was allotted to a railroad commission with the well known Viceroy Chang Chi Tung at its head. About that time and perhaps in fulfilment of this policy, the works at Hankow were begun but though 10 years have elapsed and more than 200 miles of new railroad have been built, we believe the rails laid down have all been from foreign works.

There is no doubt that the difficulties of inaugurating the steel industry in China are very great and there is a hard task before the Chinese if they attempt to carry out their chosen policy. It is not only that Western ways are hard to learn and that Chinese ways must be unlearned. What that habit is, was well shown by a recent despatch announcing that an official (mayor) of a town on the route taken by the Court on its way back to Pekin, was degraded, because a three days' rain had made the roads impassible and delayed progress. This action is entirely consonant with the

recognized ideas of official responsibility in that country and is a truthful picture of the Chinese inverted order of thinking. This mental condition permeates every attempt to introduce organized industries and innocently throws obstacles innumerable in the progress of the nation toward the development of its great natural resources along those modern lines which alone are possible in these modern times. How long it will take the Chinese to substitute the rule of common sense for their present obstructive ratiocination no one can say, but it is certain such changes in mental processes must be very slow.

The intellectual life of China has been so exclusively literary that the country lacks an employing class that is intelligent in our sense of the word and it also lacks an employed class that is faithful. It is common for foreigners to suppose that the native workman must be good because their house servants are so excellent, but it is often found that the man forgets his duty when he is left to work alone in the distant heading of a mine. Or the rules of a labor guild destroy all computation of costs or even prevent the completion of needed work. Mr. Kinder, the former efficient manager of the Kaiping coal mines, had several hundred feet of drifts lined with brick masonry, but he found it useless to employ trained native masons. They were all members of the guild and were allowed to lay only 250 bricks a day, as a maximum. This rule was bad enough with bricks 18 inches long and nearly a foot wide, but with the foreign bricks, 4 by 8 inches, the result was ridiculous. Mr. Kinder had to take ordinary coolies who were not admissible to the guild and train them to the difficult work he had for them.

Oddly enough one of the obstacles to railway progress in China is that the Chinese will not admit anything that is not the very best and most approved. They want bessemer rails, and we all know that a bessemer plant presupposes a large pig production, with ore and coal supplies that need railroad transportation to maintain them. These are not at hand in any of the available fields, but there are places where a Danks puddler could be supplied and better rails made than those with which American roads began. Such rails could be used to establish communication with the great coal and iron districts when the problem of native supply in any amount needed for Chinese roads would be solved. But it is very doubtful whether Danks rails would be permitted, even for this temporary use.

The railroad development of China will be a work of tremendous magnitude and in the nature of the case it will begin at the point where the first rail mill is located and if this is not at a mine the first step should be to connect it with both iron and coal by the first rails made.

The supply of the Hankow establishment is by small boats and the difficulty of running even 100-ton furnaces with such means of transport may be imagined. To establish a system based upon rail transport, or to carry out the policy which the Chinese approve, will require a well chosen location and a progressive development which we believe to be beyond the powers of native management. The only way to success that we can see is by contract with foreigners who will select the most available point, develop it by means best suited to its environment and establish such a connection between coal and iron supplies as will lead ultimately to the founding of a great plant. Such a contract is entirely possible and until it is made the Chinese are likely to be in continued dependence upon foreign supplies. China for the Chinese is a patriotic cry, but 10 years of effort under it has resulted only in increased importations from the foreigner.

THE MINING ENGINEERS IN MEXICO.

EDITORIAL CORRESPONDENCE.

The despatches received and published last week covered the trip of the American Institute of Mining Engineers up to midnight on Wednesday, November 6, when the special trains carrying the members left Chihuahua for Parral at midnight. On Thursday, November 7, the trains arrived at Parral, where a most cordial welcome was extended to the visitors. Apparently the whole city was at the station to meet them.

After this first reception the party divided into three sections, one visiting Santa Barbara, the second Minas Nuevas, and the third the works in and about the city. In this way the morning was passed with much pleasure and profit to the visitors. In the afternoon the three parties reunited, when a banquet was served in a handsomely decorated hall, and the occasion was much enjoyed by all present. In the early evening there was a ball given, after which the trains left Parral.

On Friday morning a short stop was made at Zacatecas. At this point no special programme had been arranged, but four hours were spent in visiting such mines and works as could be reached in that time, and very little of interest escaped the trained observation of the visitors. At the conclusion of this stop the trains started on their way to Mexico City.

They arrived at Mexico on Saturday afternoon at 3 o'clock, the formal welcome being postponed until the evening when the inaugural session of this meeting of the Institute was held. This session was opened by addresses of welcome from the Minister of the Interior, representatives of the City authorities and others. To these addresses President Olcott of the Institute made appropriate response. The session ended in a free exchange of personal greetings.

The next day being Sunday, no sessions were held, and the members devoted the time to sightseeing, visits to the Cathedral, and other points of interest.

On Monday, November 14, the second session of the meeting was held, at which a number of papers were presented, and the ordinary preliminary business transacted. After the session the members visited the National Library in a body, and were received there with the utmost courtesy, which was indeed shown at every point visited. A number of the members joined in excursions to points of interest in the suburbs of Mexico, including the Cortez ruins, the palace of Chapultepec and others of the interesting localities with which the neighborhood of the city abounds. In the evening the Institute received the compliment of a formal reception by the City Government at the Municipal Palace, which was accepted as a distinguished honor, and is in fact a courtesy very seldom extended to visitors. The only recent instance is the reception given to the delegates to the Pan-American Congress.

On Tuesday morning a session was held at which a number of papers were presented and others were read by title. After the session a visit was paid to the National Art Gallery. In the afternoon at 3.30 the members were formally received at the National Palace by President Diaz, being presented by United States Ambassador Powell Clayton. The President welcomed the visitors to Mexico, and offered them every courtesy in his power. After the reception there was an excursion to Guadalupe, and in the evening a reception was tendered by the resident American colony at the American Club, which was not the least pleasant of the many pleasant occasions which marked the visit of the Institute.

On Wednesday special trains were provided, and the members visited the great works now in progress for the drainage of the valley of Mexico, probably one of the greatest engineering works on the continent. It need hardly be said that these works were carefully inspected, and appealed especially to the engineers in the party. In the evening the Institute was entertained by the President at a grand banquet given in their honor by the President at the Palace of Chapultepec. This closed an almost unparalleled succession of courtesies and public honors which have made this meeting a most distinguished success.

The programme for Thursday included a business meeting in the morning, to be followed by an excursion to Cuernavaca in the afternoon.

A large number of important and valuable papers were presented at this meeting. In our last and the present issue abstracts of a few of these papers are given, and others will appear hereafter. The JOURNAL for November 30, will be a souvenir number of the Mexican meeting of the Institute, in which full accounts of the excursions to the various points of interest will be given. Abstracts will also be published in this special issue of the various papers read at the different sessions.

MANGANESE ORE IN ITALY.—In the year 1900 the production of manganese ore in Italy was 6,014 tons, against 4,356 tons in 1899; showing an increase of 1,658 tons last year.

DETERIORATION OF COAL IN TRANSPORTATION.—At the Internal Navigation Congress to be held at Dusseldorf, Germany, next year, one of the chief subjects for discussion is the deterioration of coal and coke from transportation by boat or railroad. Writers on this subject are requested to deal with the deterioration of these fuels by trans-shipment, carriage and prolonged storage, estimating the damage thus caused and suggesting methods for obviating it, such as loading appliances. Means for indirectly avoiding or diminishing these drawbacks should be considered, such as the turning of small coal into coke, and the coking of coal at the place of consumption rather than at the colliery.

COAL MINING IN BELGIUM.—The report of the inspector-general of mines for the Province of Hainault, Belgium, shows that the gross output of the collieries in 1900 was 16,532,630 tons, the highest tonnage that has yet been attained, exceeding by 671,470 tons that of 1898, which until then held the record. The mean sale price per ton was $3.38. With this rise in price there was an increase of 40 cents in the cost of mining, which was $2.61 per ton last year. The mean annual production per miner slightly increased last year, having been 917 tons against 915 tons in 1899, while the mean thickness of seams worked remained the same, 66 centimeters. Thirty-four works, with 2,746 ovens and 2,098 men, converted 2,334,030 tons of coal into 1,748,450 tons of coke, showing a yield of 74 per cent; and the mean price of coke was $5.06 per ton.

SAWDUST BRIQUETTES.—A method recently devised by Herr Heidenstamm for making briquettes from sawdust and shavings, which has been practically carried out in some large Swedish sawmills, has given excellent results, all the manipulations being effected mechanically, so that the expense of manufacture is reduced to a minimum. The method consists in compressing the matters (with a binder, if necessary) to such a point that they become plastic, after which they are forced into one or more carbonization channels, the substance being constantly compressed in the form of a solid and continuous stream. The channels, partially perforated with holes for permitting escape of the distillation products that are formed during the carbonization, are heated gradually in such a manner that the matters passing through them are subjected, during the compression, to gradually increasing temperatures, so that they issue completely carbonized.

THE PETROLEUM FIELDS OF WYOMING—II.

The Oil Fields of Fremont County.

By W. C. Knight

In the first paper—Engineering and Mining Journal *September*. 21, 1901—I discussed in a general way the occurrence of petroleum in Wyoming. In this and the papers that are to follow each field will receive special attention. The location, geology, development and prospects for the future will be the leading topics to be considered. Analyses of the oils so far as completed will be included. There are in reality five oil-fields in Fremont County, four of them wholly and the fifth in part. Three of these are associated with the Shoshone anticline, one is located some 35 or 40 miles east of Lander and the other is on the eastern edge of the county some ten miles southwest of Ervay.

The Shoshone Anticline.—This name has been applied to a long anticlinal fold located at the base of the Wind River Mountains and paralleling the range for a distance of about 50 miles. The northwestern limit of the fold is near the Big Wind River and in its southeastern extension passes a few miles east of Fort Washakie and Lander and disappears after passing to the eastward of Haily P. O. beneath a huge Tertiary bluff known as Beaver Hill. Originally this fold was covered with several thousand feet of Cretaceous rocks; but erosion has so reduced it that in several places it is only a few hundred feet to the Permian or Carboniferous along the axis. Where some of the streams cross it the highly inclined strata have been removed and the truncated portion covered with river debris. On the western side the strata are highly inclined; but on the eastern the slope is quite moderate. Along the axis there are domes developed and from the apex of these the rocks dip in all directions. This feature is so pronounced that it forms a conspicuous feature along the Little Popo Agie River.

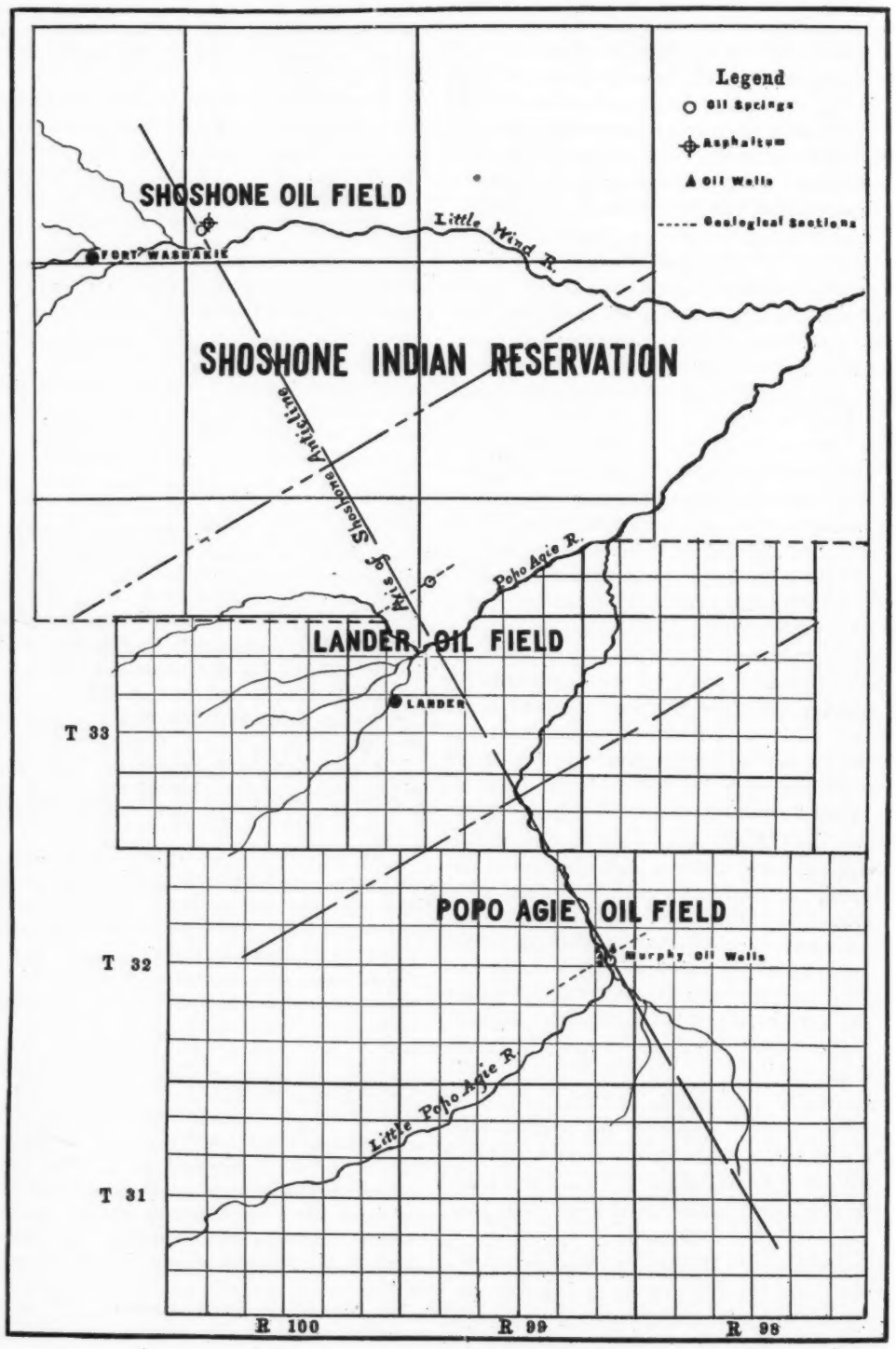
The drainage of this area is confined to the Big Horn River. Beaver Creek passes across the field near its southeastern termination and flows north into the Popo Agie River. The Little Popo Agie enters the field near the Murphy oil wells and follows a rather deep anticlinal valley for a distance of about five miles; then it takes an easterly and northerly course and joins the Popo Agie. Near Lander there are several tributaries of the Popo Agie River that cross the fold nearly at right angles. In the vicinity of Fort Washakie, Little Wind River with several tributaries also crosses the fold in the same way. These streams are usually separated by rather low divides, with occasional outcroppings of the hardest bands of sandstone. From Lander southward there are prominent bands of red Triassic sandstone forming precipitous bluffs along the eastern side of the fold. To the southwest there is a rather broad synclinal valley which furnishes excellent agricultural lands when irrigated. Northeast of the fold the country is a veritable desert, with little of any water or vegetation, the only redeeming feature thus far discovered being an abundance of coal.

Any one wishing to visit the Popo Agie Field should go to Rawlins, on the Union Pacific Railroad, and take the stage for Lander, where there are ample accommodations in the way of hotels and livery. The distance from Lander to Rawlins is about 125 miles.

The Popo Agie Oil-field.—The southeastern third of the Shoshone anticlinal has been known for many years as the Popo Agie Oil-field, and will include all of the producing territory along the fold southeast of a line drawn northeast and southwest through a point four miles southeast of Lander. It is necessary to explain the northern boundary of this field, for one not acquainted with the district the limitation may seem rather arbitrary. The oil is found in the Permian in the Popo Agie Field; but in the Lander Field on the north it is in the Dakota of the Cretaceous. On this difference in the geological position of the producing zones the fields have been separated. It is very probable that in the Lander Field the Permian will be found to be productive.

The geological structure has been referred to in describing the Shoshone anticline. The formations entering into this fold are as follows: Cambrian, Ordovician, Carboniferous, Permian, Triassic, Jurassic, and Cretaceous. All of the Cretaceous and Jurassic rocks and the most of the Triassic have been removed from the axis of the anticline. Usually it is not over 200 or 300 feet from the surface to the Paleozoic rocks. The producing zone is found near the top of the Paleozoic, in what is thought to be Permian. Below this horizon nothing is known. The Lower Carboniferous, Ordovician and Cambrian strata have a thickness of over 2,000 feet, and may contain some oil zones yet to be discovered. So far as known the oil along the Shoshone anticlinal is the only instance where it has been found in the Paleozoic rocks in the Rocky Mountain region. In the vicinity of the Murphy oil-wells the formations dip to the west at an angle varying from 65° to 70°; but do not maintain this dip for any considerable distance, for they are found nearly horizontal only a mile away. Along the eastern flank of the fold the dip is only 17°; but the surface rises very rapidly to the east and only a short distance from the wells the Jurassic rocks appear and beyond this a series of Cretaceous rocks aggregating several thousand feet in thickness, which dip beneath the horizontal Tertiary only a few miles away. On account of the sharpness of the dip to the west and the very rapid introduction of the strata above the oil zone to the east, the width of the field is not very great, and in no instance more than a few miles, and usually not over a mile and a half. The oil may be found beyond these limits; but the depth which one would have to drill to reach it would be very great, and unless under exceptional conditions would not warrant the expense. Oil may also be looked for in the strata of the Cretaceous, especially in the Dakota sandstones, along the eastern side of the field.

Where the oil wells have been drilled there is a very prominently developed dome, and with the exception of the west, the rocks dip at about the same angle in all directions. One-half mile south of well No. 1 a well was drilled to a depth of 1,600 feet and is flowing water, gas and oil. No. 1 is only 300 feet in depth and no water was found.



MAP OF THE POPO AGIE, LANDER AND SHOSHONE OIL-FIELDS IN FREMONT COUNTY, WYOMING.

1. *Records of Oil Wells.*

Name of Well.	Depth of Well.	Estimated Capacity.
Murphy No. 1	300 ft.	200 bbls.
Murphy No. 2	500 ft.	200 bbls.
Murphy No. 3	800 ft.	200 bbls.
Murphy No. 4	697 ft.	Flow strong, no estimate
Murphy No. 5	Drilling.	
Mullen No. 1.	1,600 ft.	Water, gas and oil.
Derby	No data.	

Well drilling was commenced in this field in 1883-1884 and three flowing wells were finished and packed. Steel tanks were purchased and an attempt was made to place the crude oil on the market; but the haul over 100 miles made it an impossibility. This discouragement caused the well drilling to cease and nothing was done again until the spring of 1901, when an English company bonded the property and commenced drilling. They have finished one well to oil, and have a second well under way. From present indications the district will soon be able to furnish a very large production. Just what the production will be per well has never been absolutely determined. Some have placed it at 600 barrels; but the most conservative not less than 200 barrels. From the information gathered from the drillings I judge that none of these wells have been drilled far into the producing zone. As soon as oil appeared, drilling ceased, so that it is possible that wells in this field may yield far beyond any expectations. The structure of the field signifies a large yield. With the oil there is an enormous gas pressure. Although the wells have been cased and packed and some of them weighted down to prevent wasting oil, the pressure is sufficient to raise the casing and allow the oil to escape. In this manner many thousand barrels of oil have gone to waste. Two reservoirs were constructed many years ago to catch the waste by cutting a new channel for the river and damming up two arms. At one time one of the dams broke and about 10,000 barrels of oil wasted into the river. The wells are all flowing. When turned on the gas pressure causes a furious roar before the oil reaches the surface, and then oil and gas flow together. The oil occurring in a very tough, hard formation, it will be possible to shoot these wells.

The oil resembles many of the Paleozoic oils of the East. In mass it appears black, but is reddish brown by transmitted light. It has a strong, disagreeable odor, flashes at 90° F., burns at 136° F., and is fluid at 14° F. Fresh from the well it has a specific gravity of .9000 (25.5 Baumé). Heating power, 10,437 calories per gram, which is equivalent to 14,571,000 foot-pounds of energy per pound of oil. One pound of oil will convert 19.40 pounds of water at 212° into steam.

In refining the products are gasoline, kerosene and lubricating oils, besides the asphaltum, which has a market value. With proper manipulation from 35 to 45 per cent of the oil can be manufactured into gasoline and kerosene. The lubricating oils are very heavy and appear to be of excellent quality. The amount of paraffine that this oil will yield upon distillation has not been ascertained; but there is a percentage.

*Distillation of Popo Agie Petroleum, 5 per cent Fractions.**

No of Fraction.	Boiling Point. °C.	Specific Gravity.	Degree Baume.	Flashing Point. °C.	Flashing Point. °F.	Burning Point. °C.	Burning Point. °F.	Cold Test. °C.	Cold Test. °F.
1	95-105	.7413							
2	105-205	.7841		34	94	39	103		
3	205-245	.8115	42.5	72	162	82	180		
4	245-265	.8335	38.0	101	214	117	243		
5	265-285	.8460	35.4	125	257	132	270		
6	285-295	.8615	32.5	127	261	149	301		
7	295-305	.8630	32.2	97	207	127	261	—10	14
8	305	.8665	31.6	52	126	102	216	—9	16
9	315	.8695	31.0	37	99	82	180	—3	27
10	317	.8780	29.5	57	135	89	193	—1	30
11	317	.8770	29.6	42	108	78	173	—1	30
12	319	.8755	29.9	37	99	75	167	—1	30
13		.8792	29.2	45	113	70	158	1	34
14		.8755	29.9	35	95	65	149	1	34
15		.8565	33.4	22	72	49	121	—10	14

*By Prof. E. E. Slosson.

The Lander Oil-field.—This field joins the Popo Agie on the northwest and includes the middle third of the Shoshone anticline. Most of it is within the limits of the Shoshone Indian Reservation and for this reason nothing has been done in the way of development, nor will conditions change unless it passes into other hands. The topography is less rugged than the adjoining district on the south, and is largely table lands and broad valleys where there are but few bands of rock exposed. Erosion has carried away nearly all of the projecting strata and the upturned edges have been buried with debris from the various streams. On the Popo Agie River the Triassic and Jurassic rocks are exposed along the eastern side of the fold; but only a short distance to the north these disappear and the only visible rocks belong to the Fort Benton. Beyond this the field is entirely covered with soil. The structure is somewhat questionable; but in all probability the fold is very similar to the section through the Popo Agie, except that the formations have been planed down and all of the Triassic and Jurassic rocks and the Dakota of the Cretaceous obscured.

*Distillation of Lander Petroleum.**

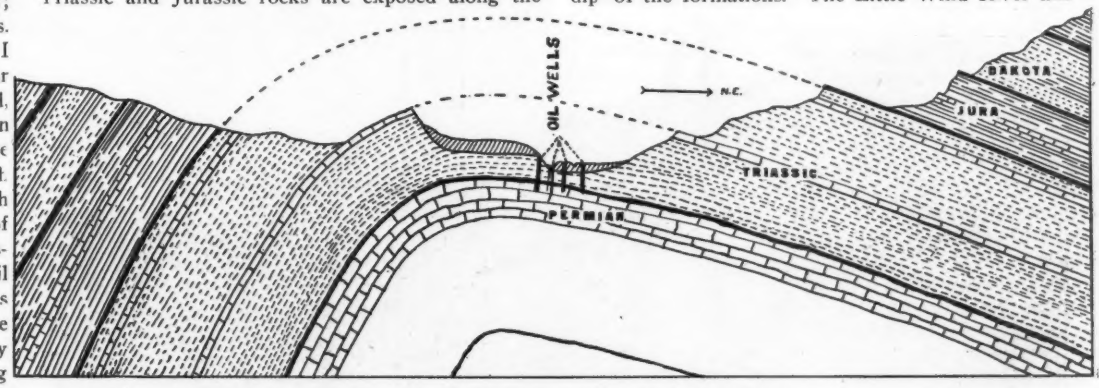
500 cubic centimeters of oil taken. Each fraction is 5 per cent.

No. of Fraction.	Boiling Point, Centigrade.	Specific Gravity.	Degree Baume.	Flashing Point. °C	Flashing Point. °F	Burning Point. °C	Burning Point. °F	Cold Test. °C	Cold Test. °F
1	155-215	.8100	42.8	51	124	62	144		
2	215-235	.8218	40.4	64	148	77	171		
3	235-250	.8313	38.4	82	180	93	200		
4	252-265	.8400	36.7	94	202	109	229		
5	265-280	.8452	35.6	107	225	122	252		
6	280-285	.8500	34.6	117	234	135	275		
7	285-290	.8510	34.4	120	248	137	279		
8	290-295	.8565	33.4	124	256	142	288		
9	295-310	.8640	31.0	137	279	157	315		
10	310-325	.8680	31.3	107	225	122	252		
11	325-340	.8740	30.2	152	306	178	353		
12	340-345	.8725	30.5	147	297	167	333		
13	345-355	.8745	30.1	151	304	167	333	—9	16
14	355-365	.8820	28.7	137	279	184	364	—2	28
15	365-375	.8835	28.5	142	288	177	351	1	34
16	375	.8705	30.8	109	225	132	270	5	41
17	380	.8505	34.5	57	135	84	184	0	32
18	385	.8800	29.1	57	135	84	184	9	48

By Prof. E. E. Slosson.

The only oil thus far found in this district comes from a fracture in the Fort Benton shale about three miles northwest of the Popo Agie River. This has been known for a number of years as Washakie's oil spring, and for a long time was claimed by the late Chief Washakie of the Shoshones. The oil originally flowed over the surface of the shale and was evaporated by the sun's heat. In recent years there has been a pit dug in the shale and small quantities of oil are annually collected. The oil comes in all probability from the underlying Dakota sandstones, which are a source of oil in many other fields in Wyoming. When this field is developed it is very probable that there will be a Permian unbroken arch found to the westward of the oil spring, and that beneath this arch one is very likely to find an oil horizon that will surpass in importance the present producing spring or any well drilled to that source of oil. The remarkable feature in connection with the oil samples of this region is the great difference between the oil of the Popo Agie and the Lander fields. The Popo Agie has an asphalt base and contains considerable sulphur, while the Lander has a paraffine base and contains little or no sulphur. The Lander oil is very light and will refine into a large percentage of kerosene, with little or no heavy oils. The crude oil fresh from the spring has a gravity .8565 (28.5 Baumé), flashes at 99° F, burns at 113° F. It is green by reflected light and bright red by transmitted. The heating power is 10,883 calories per gram, which is equal to 15,204,000 foot-pounds per pound. One pound of oil will change 22.24 pounds of water at 212° into steam. The following is an analysis of a sample of oil taken from the spring, where it had lost some of its lighter oils by the heat of the sun:

The Shoshone Oil-field.—This field includes the northwest third of the Shoshone anticlinal, and is wholly upon the Shoshone Indian Reservation. In structure it is identical with the Popo Agie, with the possible exception of a slight difference in the dip of the formations. The Little Wind River has carried away the apex of the fold where it crosses the field; but to the south and only a mile or so to the north the red Triassic sandstones outcrop conspicuously. The structure and geological features will not be referred to, owing to its similarity to the Popo Agie, and since the Popo Agie geological section gives a very clear idea of the structure of this one. The evidence of oil is confined to a single locality, where there are several places where oil has been coming to the surface for a very long period of time. This is located about a mile and a half northeast of Fort Washakie, and about 1,500 feet north of the Little Wind River in a soil covered valley along the axis of the fold. About the oil spring there is quite an accumulation of asphaltum attaining a maximum thickness of 3 feet and 150 by 300 feet in lateral extent. This has been produced by the oil coming to the surface and the sun evaporating all of the lighter constituents. The oil is identical with the oil from the Popo Agie Field, comes from the same formation and reaches the surface through a fissure in the Triassic red sandstone. A well drilled to a depth of 500 feet near the springs will surely pierce an unbroken arch, and the result will be a heavy flow of both oil and gas. Finding oil at either end of the Shoshone anticlinal that is identical and also finding it in the same geological horizon has a considerable significance. There is every reason for believing that this fold is more or less oil-bearing for its entire length, and when developed we may expect to see derricks scattered along for a distance of over 40 miles, and to see a great oil-field varying from one to two miles in width producing millions of barrels of oil. At present nothing can be done with



GEOLOGICAL SECTION OF THE POPO AGIE OIL-FIELD.

the field; but in a few years the Indians will undoubtedly sell the reservation and give some one an opportunity to develop it.

Before leaving the question of oil production along the Shoshone anticline a few additional remarks are necessary. The proper development of these fields depends largely upon the construction of a railroad or a pipe line. At present it will be impossible to do more than make illuminating oils to supply the local trade. With a railroad that would handle the oil there is a chance for one of the largest industries in the State of Wyoming to be launched. The districts are in the midst of an agricultural country, supplied with mountain water and an abundance of coal and wood. Living is cheap, as compared with other oil districts in Wyoming and the cost of drilling will be found unusually low on account of the favorable formations overlying the oil.

The Beaver Oil-field.—This is located some 35 or 40 miles nearly east of Lander in the midst of a desert. The nearest palatable water, or water of any kind in quantity, is from 3 to 5 miles from the oil springs. Oil has been known in this field for many years and some 15 or 20 years ago a company started a well, which was abandoned long before it was deep enough to reach the oil sand. The geology of the region is imperfectly known. To the south and west there is a vast Bad Land country, and jetting out from beneath one of the Tertiary bluffs there is a slight exposure of highly inclined Cretaceous rocks. Further to the northward the Cretaceous formations are nearly horizontal and within a distance of 6 miles there are coal veins cropping to the surface. The Cretaceous exposures that are highly inclined and are associated with the oil indications are Dakota and Fort Benton formations. Only one limb of a fold is uncovered and the axis has not been determined.

OPENING OF MURPHY OIL WELL NO. 2, WYOMING.

Both oil and gas escape from several springs in the Dakota sandstone. The oil is a dark green color, having a gravity of .9650 as taken from the spring. This oil had been standing for some time and was very much heavier than the crude would be if taken from a well. The oil is a heavy lubricant, with little or no sulphur, and judging from the springs will have a paraffine base. No reliable analyses have been made of this oil on account of the difficulty in collecting typical samples. During the coming summer the University Geological Survey will investigate the Beaver Field and publish the results.

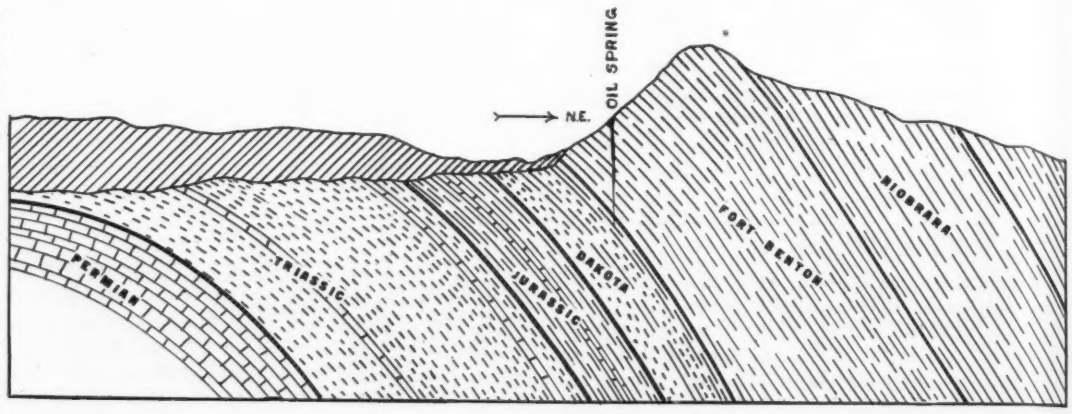
The Dutton Field.—Since this field is only partially in Fremont County and more closely associated with the fields of Natrona County, it will be described with the other oil-fields of that county, in a later paper.

THE KETCHIKAN MINING DISTRICT, ALASKA.

By William T. Brewer.

Within the boundaries of this district are included the islands known as Prince of Wales, Revillagigedo, Annette, Gravina, Duke, Mary, Wales, Dall, Long, Filmore and Etolin. That portion of the mainland of Southeast Alaska lying north and west of the boundary line between Alaska and British Columbia extending an undetermined distance to the north beyond latitude 56° is also embraced within the boundaries. Ketchikan, the distributing center, situated on the southwest coast of Revillagigedo Island, is the most southern United States port of call and Custom House in Alaskan waters. Until about two years ago the port was on Mary Island, a few miles southeast from Ketchikan, but the change was made to the last named location when the northern trade showed evidence of becoming permanent and important. Ketchikan, previous to the establishment of the Custom House, was an important fishing station having its cannery and saw-mill, Indian village and small white settlement, but to-day it boasts of a white population of about 500 or 600, and is a typical frontier mining town, though much more orderly than many of the old-time camps in the States. The distance from Seattle is about 600 miles and during the summer months the trip occupies about two days. The extent of the district can hardly be appreciated until a visit has been made and an examination attempted.

The discovery of metaliferous minerals on Prince of Wales Island first brought the district into public recognition and gave an impetus to the growth and prosperity of Ketchikan. Since then discoveries on others of the islands have attracted prospectors and representatives of mining operators, until to-day there are probably nearly 2,000 men scattered along the coast lines engaged in prospecting or developing prospects.



GEOLOGICAL SECTION OF THE LANDER OIL-FIELD.

Prince of Wales, the largest island, is about 120 miles long and some 40 miles wide, while Revillagigedo, the next largest, is about 30 miles long and 20 wide. Their extent is best realized by following the coast lines along the mainland and around the islands and noting the long canals and inlets with their innumerable bays, coves, sounds and the long promontories, all of which add miles to the distance around even the smallest of the islands. Nature in this respect has been very generous in furnishing highways by which the explorer, engineer and prospector can travel and pursue his favorite avocation.

This system of inland waterways has, of course, rendered the building of long trails and wagon roads almost unnecessary. Consequently horses are unknown in this extensive domain; in fact, only one horse lives in the district at the present time. Sloops, rowboats and canoes are the favorite means of conveyance besides the mail steamers and launches which ply from Ketchikan to points on the coast. Owing to the unique conditions the prospectors have only penetrated comparatively short distances into the interior from the shore line. The most important consideration has been to make discoveries as close to deep water harbors as possible and thus insure the cheapest possible transportation facilities. The following list of camps with their distance from Ketchikan to which the local steamer makes regular trips will enable the reader of this article to form some idea of the extent of country which has been partially exploited.

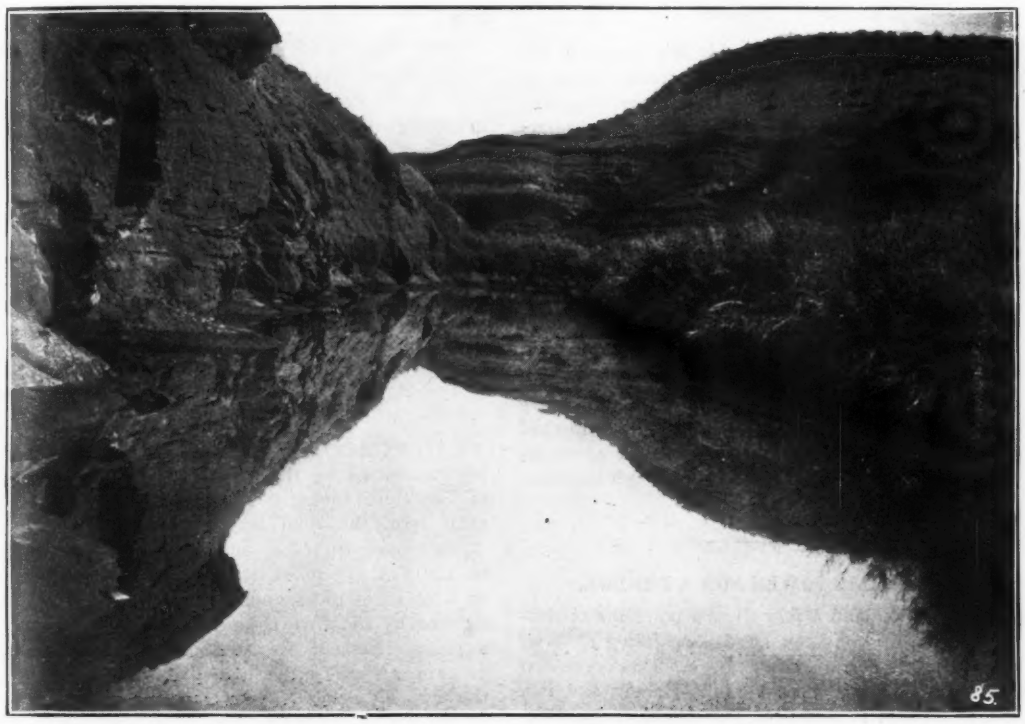
Sea Level on Thorn Arm, Revillegigedo Island, distant from Ketchikan 24 miles, gold-bearing quartz. Port Johnson (Dolomi P. O.), Prince of Wales Island, distant 32 miles, gold and silver ores. Moira Sound, Prince of Wales Island, distant 40 miles, copper ores. McLean's Arm, Prince of Wales Island, distant 35 miles, copper ores. George Inlet, Revillagigedo Island, distance 13 miles, lead ore. Mount Andrew, Prince of Wales Island, distant 25 miles, copper ore. Hollis, Prince of Wales Island, distant 41 miles, gold and silver ores. Anderson's Camp, Kassan Bay, Prince of Wales Island, distant 30 miles, copper and gold ores. Tolstoi Bay, Prince of Wales Island, distant 35 miles, copper and magnetite ores. White Eagle, Prince of Wales Island, distant 30 miles, copper ore. Karta Bay, Prince of Wales Island, distant 35 miles, gold ore. Hole-in-the-wall, Prince of Wales Island, distant 25 miles, copper ore. Copper Mountain, west coast Prince of Wales Island, reached by portage from the east coast and distant 52 miles, copper ore. Sulzer, west

coast Prince of Wales Island, reached by portage and distant 46 miles, copper ore. Helm Bay, Cleveland Peninsula on the mainland, distant 22 miles, gold ore. Seal Bay, Gravina Island, distant 12 miles, copper ore. Skowl Arm, Prince of Wales Island, distant 31 miles, copper ore. Niblack Anchorage, Prince of Wales Island, distant 31 miles, copper ore. Dall Head Harbor, Gravina Island, distant 15 miles, copper ore. Smuggler's Cove, Annette Island, distant 22 miles, gold ore.

From the foregoing list it will also be noticed that the district produces a diversity of ores, and that the discoveries have been made in camps scattered over the country and usually situated at considerable distances from each other, but within easy access from Ketchikan by water. As no surveys have been made through this extensive district, the only maps from which any reliable information can be gleaned are the charts mapped by the United States Coast and Geodetic Surveys. Of course, these charts do not show the topography of the interior except some of the highest peaks close to the coast. The altitude of many of these are marked on the chart, the heights varying form about 1,000 to 6,000 feet. The mountain peaks farther distant from the shore lines are much higher, some probably reaching 7,000 or 8,000 feet.

The timber is very dense, and especially the undergrowth—the devil's club and sallal—covers the surface of the low ground, rendering travel very slow and tiresome. As height is gained in climbing the mountains this undergrowth becomes more scattering, and disappears almost entirely near the summits. There is a marked difference in the size of the timber in the latitude of Ketchikan and farther south. This is so noticeable from the deck of a steamer that one is inclined to designate the timber as scrubby when compared with the giant trees of Washington and Southern British Columbia, but a closer inspection proves that although not as large, rarely reaching a diameter of over 6 feet at the butt instead of 8, 10 and upwards, as is the case farther south, yet the timber, especially on the inlands, in the Ketchikan District is of such size and abundance as to form a valuable natural resource of the country. Several saw-mills have been already established in near proximity to Ketchikan, and furnish all the lumber for local use. This is no small business either, as is attested in the town of Ketchikan alone, where all the streets are merely sidewalks, and a large proportion of the buildings are built on piling along the shore. This feature presents an unique picture to the eye of the newcomer or "chi-charco" in the Chinook dialect.

No one until he has tried traveling inland from the coast can have any conception of the difficulties under which the prospector, with his pack on his back, labors in his search for mineral. Nor are these the only obstacles in his path, for he finds a heavy growth of moss covering the rocks, and natural exposures of outcroppings very few and far between. Traveling is expensive in any way one can adopt, the steamer fares being high as compared with the Sound country, because fuel and supplies are high. If a sloop or rowboat is used, the time necessarily occupied in moving from place to place, waiting for wind or tide or laying by during storms, causes the cost to run up. The season during which the prospector can work is short, for while the winters are not severe, yet the rain on the lowlands and snow-



LAKE OF OIL IN POPO AGIE OIL-FIELD, WYOMING..

fall on the mountains are so excessive as to make exploration not only uncomfortable, but hazardous to the health. When all of these conditions are considered, it is not at all surprising that more thorough work has not been done, especially in a country unknown until about four years ago.

Previous to 1898 no systematic attempt had been made to explore any of this portion of Alaska. A good deal of travel into the Omenica placer country from Wrangel at the mouth of the Stikine River, about 100 miles farther north, had been going on since the sixties, and the Skeena River territory, about 100 miles south, had been run over by placer miners who worked in the Cassiar diggings about the same period; but the section of the country lying between, which to-day forms the Ketchikan Mining District, was unknown except to the fishermen who worked for the salmon canneries. This mining district is not in any sense a "poor man's country" and never will be. In order to even prospect it is necessary to have capital, and more necessary still to have it to open up and develop a prospect. No matter how near the shore-line a prospect is located there is always the question of transportation to the vessel. This necessitates the construction of some kind of wharf or at least a raft, anchored at a convenient distance from the shore, as well as a tram track or aerial tramway from the mine workings to the shore. While these improvements may not entail any large expenditure, there is the cost of opening the prospect to that point where it is demonstrated that sufficient ore of high enough grade can be extracted to warrant even the initial expenditure. Cheap cost for transportation to the smelters on the coast offsets to a great extent the initial expenditure necessary, and this feature is one worthy of the consideration of capitalists, because it warrants the mining and treatment of ores of such low grade as would be impossible in many inland camps where railroad transportation from mine to smelter was compulsory.

The opportunities for local smelting of the base ores are excellent. The fluxes occur apparently in great abundance, fuel for calcining is inexhaustible, water powers for running mining machinery are found in nearly every mountain stream, while coke can be obtained from Vancouver Island at a cost much less than that at which the Crow's Nest coke is supplied to the Boundary smelters in British Columbia. Consequently the cost for smelting the ores of Southeastern Alaska in local smelters should not exceed the lowest cost attained in the most favored sections of British Columbia, and would be regulated in proportion to the capacity of the smelting plant. A camp once established, work underground can be continuous the year round, since there is no danger of the water supply freezing or of depth of snow preventing or hindering travel, or the usual surface work carried on around smelter, mills and mine workings. Therefore, while this portion of Alaska is not a "poor man's camp," it is an ideal location for the establishment of mining industries by capital, provided, of course, ore-bodies of sufficient grade and extent for profitable workings are found to occur.

Having arrived at this point the writer will devote the remainder of this article to a description of the various sections already partially prospected in this portion of Alaska and attempt to give the reader an intelligent idea of the future possibilities from the standpoint of a conservative observer.

The best idea of the enormous extent of the Ketchikan District can be formed by marking the portions prospected on one of the United States charts, showing Clarence Strait, Revillagigedo Island and Portland Canal, which practically takes in the entire district. The territory of which absolutely nothing is known by white men is so enormous when compared with the prospected territory that no comparison can be made, and yet since 1898 considerable activity has been evinced by a small army of prospectors.

Prince of Wales Island has received the most attention, and there is apparently a zone of undetermined width extending in a northwest direction from McLean's Arm on the east coast near the south end of the Island to Tolstoi Bay on the same coast about 60 miles distant, through which heavy outcroppings of pyrrhotite and magnetite ore impregnated with chalcopyrite have been discovered.

The occurrences of these surface indications, so far as at present known, are widely scattered, for up to date at only seven points along this zone have discoveries been reported. The country rock is of igneous origin. The work performed at most of the camps is very limited in extent and not sufficient to warrant the expression of any opinion as to the possibilities or value of the discoveries. The zone may be found to have a width of about four miles, because on the western side of the island, which is reached by a four-mile portage from North Arm, the same character of outcroppings are reported at the Sulzer Group of mineral claims on the east side of Copper Mountain, but a short distance to the west; and on the Mellen property on Copper Mountain the formation changes, and at a contact of granite and limestone a high grade of copper carbonate ore occurs. This discovery was to a very great extent the reason for the present activity on Prince of Wales Island, but up to date it is the only occurrence of that class of ore reported. As to any efforts made to trace the contact beyond the Mellen property, the writer is not informed, but when the success which has attended the exploitation of contacts of limestone and igneous rocks in other sections, notably in British Columbia, is taken into consideration, it would appear that the contact at Copper Mountain should be thoroughly and systematically followed out.

Although the Mellen property is reported to have been bonded for $600,000 for a 75 per cent. interest, and some small shipments of high grade ore have been made, yet the development work has not been so extensive as a stranger to the district would have looked for. The same criticism applies to the Sulzer Group of mineral claims, although it is expected in the near future a systematic effort to determine the value of the proposition will be made. Should future work result satisfactorily on Copper Mountain, it will undoubtedly prove an incentive to prospectors to make an extra effort to explore, and thoroughly prospect the western side of the island; but at present all their efforts appear to be concentrated on claims on the eastern side. There is not enough known yet about the geology of Prince of Wales Island to attempt to connect the formations with those occurring to the southeast in British Columbia, but from the data now at hand one cannot help being impressed with the similarity, especially of the zone in which occur the pyrrhotite and magnetite ore outcrops, between the eastern portion of Prince of Wales Island to the southeast, very much the same conditions exist, and the suggestion of a relationship between the geology of these fields, though so far distant from each other, forces itself on the mind of one who has made a careful study of the geology of the coast and adjacent islands. However, many years at the present rate of exploration, must elapse before the correctness of any theories can be established.

Kassan Peninsula has really received more attention during the past season than other portions of tne Prince of Wales Island. Three companies are working within short distances of each other near the southern coast of the peninsula. These are the Mount Andrew, the Copper Queen and the White Eagle. The results of the development work performed by these companies is being watched with considerable interest, but up to the present time but little can be said beyond recording the fact, that each one is working according to the judgment of its manager to attempt to determine the value of the claims.

At Tolstoi Bay, Skowl Arm, North Arm and McLean's Arm discoveries have been made and prospecting is being prosecuted.

In addition to the occurrences of copper bearing ores discoveries of gold bearing ores have been made at Hollis at the head of Twelve-Mile Arm, also at Karta Bay. These are partially free milling and some sample shipments have been made from Hollis to the coast smelters in Washington. Some of the ore is quite high grade and there is talk of erecting a stamp mill at Hollis next spring. The limited development work accomplished so far is the only factor unfavorable to Prince of Wales Island. But the camps are young and there is but little doubt that 12 months hence a very different aspect will predominate.

Passing from Prince of Wales to Revillagigedo Island, one enters an entirely different geological field. On the latter, chloritic schists predominate, innumerable veinlets of flinty quartz occur in these schists, but this quartz rarely carries any values, neither are the lenses of sufficient extent to warrant prospecting.

At the head of Thorne Arm, 24 miles distant from Ketchikan, by water, in a northeasterly direction, a strong vein traverses the schists. Its line of strike is N. 65° E. (magnetic), while the strike of the country is northwesterly, the dip of the vein being vertical. A shaft 115 feet deep has been sunk, and about 700 feet of drifting done, a portion on the 50-ft. and the balance on the 100-ft. level, besides some open-cut work. The ore taken from the drifts lies on the dump, but no stoping ground has been opened, although a wharf, a 30-stamp mill, concentrators, air compressor, hoist and water pipe line are being installed by the Hammond Manufacturing Company, of Portland, Ore.

The vein filler is white quartz carrying a portion of its values free and the remainder in the sulphurets. There are apparently two veins with an igneous dike occurring as a parting between them. This dike in places is 15 feet wide and the maximum thickness of both quartz veins about 11 feet; the widths, though, of veins and dikes are variable. The dike carries considerable iron pyrites, which, it is claimed, is auriferous and will yield a substantial addition to the values carried in the quartz.

On George Inlet, also on Revillagigedo Island, discoveries of galena have been made and several specimens of the ore are on exhibition in Ketchikan, but little work has been done though to develop the prospects or determine their values.

At the head of Helm Bay, on Cleveland Peninsula, a portion of the mainland gold-bearing quartz has been discovered, but only a little work has been done.

On Gravina Island, at Dall Head, the extreme southern portion, copper ore has been found. This is only 15 miles from Ketchikan, in a southerly direction. On Annette Island, at Smuggler's Cove, 22 miles southerly from Ketchikan, gold-bearing quartz is reported.

In order to examine thoroughly this extensive district adjacent to Ketchikan, a full seasor would be none too long, and even then but a very imperfect conception of the geology and mineral resources could be formed. The flying trip made by the writer at the commencement of the stormy season, when travel was most uncomfortable, either by water or through the brush, impressed on his mind that the district was one full of possibilities, and promised if thoroughly and systematically developed to furnish opportunities for a large population. The difficulties attending extensive exploration while, not insurmountable, are by no means to be despised. The field is big enough to occupy the attention of an army of prospectors and geologists for years to come. Up to the present time it has not even been scratched over, for beyond the staking of a number of claims and partial development of a few, there has been practically nothing done.

HYDRAULIC POWER FOR A DREDGE.

The New Zealand *Mines Record* notes the conversion of the Consolidated Dredge operating at Waipovi from steam to hydraulic power. This is the first important case of the kind in the Colony, and is a matter of some importance. The machinery was devised and patented by Mr. O'Brien; the changes required consisted only in disconnecting the engine and replacing it by Pelton wheels driven by water-pressure from the neighboring hillside. Mr. O'Brien has had a small dredge at work on this principle for over a year in the Lammerlaw Creek, but this is the first time it has been applied to a dredge of average capacity, and it proved a complete success.

The water is brought to the wheel through a pipeline about 4,000 feet long. At the intake the pipes are 11 inches in diameter, narrowing to 9 inches in their middle course and to 7 inches at the dredge, where the water is delivered at a head of 163 feet. In addition to the pipe-line there are four pontoons, 6 by 5 feet, upon which are placed universal joints, to which the pipes are attached. A ball-joint, connected with a universal joint, is placed on shore, and a similar arrangement on the first pontoon, which permits of its rise and fall with the water in which it is floating without undue strain being placed on the pipes. On the other pontoons the universal joints only are used. Another one is set up on the dredge on a 4-in. plank, supported by travelers, which run on an ordinary railway rail with a slight curve. This enables the dredge to work out difficult corners without trouble, being able to turn at any angle. The water is then directed on to the main Pelton through a 1¾-in. nozzle. The Pelton, being 4 feet in diameter, supplies the power for the buckets and the pump. A 3-in. branch from the main is directed through two ⅝-in. jets on a reversible Pelton, which is controlled by a three-way cock or valve. This Pelton was made by the firm of A. & T. Burt, Dunedin, from an original design by Mr. O'Brien. It is used for driving the winches. The capacity of the buckets is 3¼ feet.

PLATINUM IN PLACE.—Professor J. F. Kemp, of Columbia University, states that samples of rock sent into the United States Geological Survey for examination by J. C. Carter, of Leavenworth, Washington, contain three-eighths of an ounce of platinum metals to the ton, and finer material from the same locality contains one-half ounce to the ton of ore.

IRON PRODUCTION IN AUSTRIA.—The official returns place the production of iron ore in Austria in the year 1900 at 1,894,458 metric tons, against 1,725,144 tons in 1899; showing an increase of 169,314 tons. The output of pig iron was 1,000,207 metric tons, against 996,385 tons in 1899, an increase of 3,822 tons. The output in the leading districts was: Bohemia, 281,639 tons; Steiermark, 275,901 tons; Mähren, 271,304 tons.

THE WELSH TIN PLATE INDUSTRY.—The London *Engineer* reports that the tin-plate industry of South Wales is showing signs of renewed prosperity. At the end of September there were 377 tin-plate mills at work, as compared with 349 mills working at the end of August. Thus there has been an increase of 28 mills in the course of one month. These 28 mills would have a producing capacity of about 15,500 boxes per week. There are at present 60 idle mills. In September the total exports of tin-plates and black plates amounted to 29,745 tons, and in August they were 25,684 tons, or an increase for September of 4,061 tons.

RAILROADS IN RUSSIA.—According to the returns issued by the Russian Ministry of Ways of Communications, it appears that on September 1/14, 1901, the total length of Russian railways thrown open to traffic amounted to 52,277 versts, or about 34,855 miles, in addition to 9,534 versts, or 6,356 miles of secondary lines; 34,423 versts are worked by the Crown, and 15,276 are private enterprises. Finland has 2,678 versts, or 1,786 miles, of railroad under the immediate management of the Finnish Senate, and 157 versts, or 105 miles, in the hands of private companies. New lines are being constructed to the length of 8,257 versts, or 5,505 miles; the construction of new lines to the amount of 3,065 versts, or 2,043 miles, has already received Imperial sanction. To these figures must be added the Eastern China Railway, with its branch line between Port Arthur and Dalny, a total of 2,413 versts, or 1,609 miles.

THE NOMENCLATURE OF METALLOGRAPHY.—In view of the fact that the nomenclature of metallography is becoming more and more involved, says the *Journal* of the Society of Chemical Industry, the council of the Iron and Steel Institute of Great Britain has appointed a representative committee to consider the matter, and to ascertain whether it would be possible to take steps to make the terminology less complicated and more precise. The committee has not met yet, but a preliminary glossary of over 150 words has been drawn up and printed, which may lead to the simplification and unification of terms already in use, and to the elimination of some of them. As far as possible the exact equivalents in French and German will be added, and it is hoped that the present effort will render some assistance in the production of the great *International Technical Lexicon* now being prepared under the direction and at the cost of the Society of German Engineers. In view of this analogy to petrography and to the study of meteoric iron, metallography necessitates the use of similar technical terms, and it is desirable that, wherever possible, the same terms should be used as are familiar to the mineralogists and geologists, and that the coining of new words should be avoided.

THE IRON ORES OF SANTIAGO, CUBA.*

By Arthur C. Spencer.

It is the purpose of the writer to record in the present communication some observations and conclusions concerning the occurrence and origin of the iron ores of Santiago, Cuba. †The ores are commercially known as hard hematites; mineralogically, however, they are almost pure magnetites, with a possible excess of Fe_2O_3. The percentage of iron ranges from 60 to 72 per cent. and both sulphur and phosphoric acid are very low, so that the ores are particularly well suited for the Bessemer process.

In undertaking a careful study of the ore bodies revealed in the extensive workings of the Juragua and Spanish-American companies' mines, it was hoped that some general law of occurrence would be revealed which would afford a basis for the further exploitation of the deposits. No such law was discovered, however, and though the mode of occurrence was definitely determined, it was found to be such that the position of ore bodies and their extent can never be determined, excepting by a careful magnetic survey. Each body of ore is separated from all others by masses of barren rock in such an irregular way that the distance between adjacent ore bodies may be very small or large, just as the ore may occur in small or large masses. While the ore bodies are very irregularly distributed within the productive belt, the ore-bearing zone has a definite trend along the seaward side of the Sierra Maestra, which parallels the southern coast of Santiago Province. This trend, as will presently appear, is expressive of certain general geological features of the region.

Iron ores are now being mined at only three localities, although they are known to occur in large quantities at several other places along the seaboard, both to the east and west of Santiago. (See sketch map, Fig. 1.) The mines of the Cuban Steel Ore Company are located at Guama, some 35 miles west of Santiago Bay, and still west of these large deposits are known on the Rio La Plata, and others have been located between them and Santiago. East of Santiago the largest occurrences are at Sevilla, Firmeza, Daiquiri, Berraco and Sigua, respectively 5, 9, 18, 21 and 25 miles east of Santiago.

Of these localities only the first four of the eastern group were visited, and nearly all the data were collected at the mines of the Juragua Company at Firmeza, and those of the Spanish-American Company at Daiquiri and Berraco.

Geological Relations.—The coast from Siboney to Sigua is bordered by a line of hills which, although cut through at intervals by stream valleys, forms a barrier between the sea and a region of lowland in front of the foothills of the Sierra Maestra. The tops of these hills and their seaward slope are covered by a thin veneer of recent coral limestone, evidently deposited during a period of gradual uplift of the land. The landward slope and much of the adjacent country is occupied by a coarse-grained quartz diorite, which is well exposed beneath the limestone at the Playa, where the ore docks of the Daiquiri mines are located. Back of this belt of diorite, which has a width of about 3 miles, and covering the low ground back of the coastal barrier as well as the lower foothills of the Sierra Maestra, there is a zone characterized by intrusive masses of porphyry. Near the southern edge of this zone, the porphyry occurs in the form of extremely irregular dikes, and these dikes become larger and more numerous in the higher foothills to the north. It is within these foothills that the iron ore occurs. Above them the slopes of the Sierra Maestra are composed of bedded volcanic rocks with a few intercalated beds of limestone or limestone breccia. The lower flows are of a basaltic nature, but some of the uppermost are rhyolitic, while upon the top of the mountain the massive rocks are overlaid by rhyolitic breccias, which constitute the base of a series of fragmental volcanic rocks occupying the northern slope of the range. These features are indicated in the accompanying diagram (Fig. 2), which represents also the general geology and structure of the Sierra Maestra from Cabo Cruz to the vicinity of Guantanamo Bay.

FIG. 1. SKETCH MAP OF SANTIAGO MINING DISTRICT, CUBA.

Description and Origin of the Iron Ores.—The iron-bearing rocks occupy a zone along the foothills or upon the southern slopes of the mountains, between a belt of granular diorite on the south and a series of volcanic flows on the north. In the mines at Firmeza the ores are associated with hornblende and epidote schists, and crystalline limestone or marble. All these rocks and the associated iron ores as well are penetrated in a very irregular way by dikes or stocks of the same porphyry that cuts the diorite, and they are thus broken up into irregular blocks. The relations between the ore and the metamorphic rocks is such that the origin of the former is probably to be connected with the chemical changes to which the latter were subjected at the time of their metamorphism, though there are some facts which point to the possibility that the magnetites may be of magnetic origin. The porphyry alone, of the two varieties of igneous rock, has been seen in contact with the schists and ores, and the nature of the schist inclusions in the porphyry shows definitely that its laminated structure is of earlier origin than the date of the porphyry intrusion. It is possible, however, that the ores have originated within the schists and limestones from contact metamorphism due to the diorite, but no data are available to prove or disprove this suggestion, as all the relations observed would as naturally occur if the ore had originated entirely previous to the intrusion.

In the few cases where schist and ore were seen in contact there is a rather rapid gradation from the one into the other, and quite beyond the limits of what could be designated lean ore, there are seggregations of magnetite and epidote, which have the appearance of being secondary in the hornblende schist, as illustrated in Fig. 3, taken from a sketch made while studying the East Mine at Firmeza.

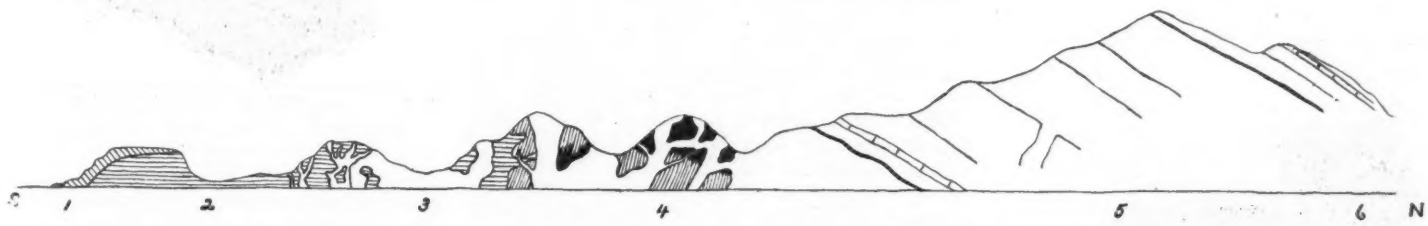


FIG. 2. DIAGRAMMATIC GEOLOGICAL SECTION THROUGH IRON ORE ZONE FROM THE SOUTH COAST TO THE SIERRA MAESTRA.

1. Recent Coral Rock.
2. Diorite.
3. Diorite-porphyry.
4. Iron ore and enclosing schist.
5. Basalts, tuffs and limestone breccias.
6. Coarse volcanic breccias (acidic) interbedded with beds of limestone.

Evidence against the origin of the ore as the result of differentiation from the porphyry during the period of its cooling and at the same time against its origin as the result of contact metamorphism due to the porphyry is seen in the clear cut surfaces where the porphyry and ore come in contact, and in the narrow dikes of porphyry cutting the ore, and proving the subsequent intrusion of the porphyry.

The relations of the ore in the Northeast Mine, of the Juragua Company, are illustrated in Fig. 4. At this place the magnetite seems to be an intrusive dike cutting across a mass of crystalline limestone into which it sends a short apophysis. Specimens collected along the periphery of the invading arm show a rather rapid gradation from the pure magnetite to the marble, leaving a doubt as to whether the ore is a replacement of the limestone or is, as it appears, the result of igneous intrusion. If the latter supposition is correct two alternatives remain; one, that the ore is a replacement of some igneous rock; the other, that it represents an extreme basic differentiation of an igneous magma. In the latter case its occurrence in the form of a dike is of extreme interest since hitherto it seems that iron ores of original igneous origin have only been found associated with the gabbroic magmas from which they have been differentiated. The absence of any true gabbros in

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†Upon this subject see: 1. The Iron Ore Range of the Santiago District of Cuba, by James P. Kimball, *Transactions* American Institute Mining Engineers, Volume XIII, pages 613-633, 2 maps, 1885. 2. Geological Relations and Genesis of the Specular Iron Ores of Santiago de Cuba, James P. Kimball, *American Journal of Science* (3), Volume XXVIII, pages 416-429, 1884. 3. Iron Ore Beds in the Province of Santiago, Cuba, by F. F. Chisolm, *Proceedings* Colorado Scientific Society, Volume III, pages 259-263, 1890.

this region is perhaps an *a priori* reason for doubting the origin suggested, but the diorites approach gabbros in their composition, showing even some of the structural features characteristic of gabbros, as for instance, a politic arrangement of constituent minerals. Magnetite, occurring in the form of dikes cutting a country rock of metamorphosed calcareous nature was again observed in the trial workings at Berraco, and here the indications are strongly suggestive of an intrusive origin. The age relations of the porphyry dikes, shown in the illustration (Fig. 4), are corroborated by the similar features brought out in the following discussion of the Lola and Magdalena ore bodies.

In the mines at Daiquiri there are but small amounts of schist and no limestone, the ore in this locality occurring enclosed in the porphyry unaccompanied by these rocks. Dikes of the porphyry also penetrate the magnetite and cross from one side

FIG. 3.—MAGNETITE AND EPIDOTE NEAR ORE-BODY IN EAST MINE, FIRMEZA.

h. Hornblende schist. ep. Granular epidote.

of the ore bodies to the other. The narrow dikes are sometimes banded along the contacts with the ore, through rapid cooling during the injection of the molten rock. These penetrating dikes are of the same rock and continuous with the surrounding porphyry, the only difference being a greater density; a fact which proves beyond all doubt the subsequent origin of the porphyry. These features are illustrated in the diagrams representing the ore bodies in the Lola and Magdalena mines, Figs. 5 and 6, in which the clear-cut contacts of the ore and porphyry are not at all exaggerated, since there is in these mines absolutely no gradation between the ore and country rock.

The suggestion that the magnetite may have re-

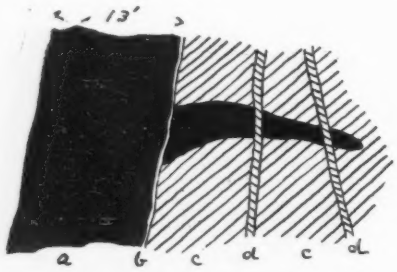


FIG. 4.—SMALL ORE-BODY, NORTHEAST MINE OF JURAGUA COMPANY.

a. Magnetite. b. Selvage impregnated with chalcopyrite. c. White marble belonging to schist series. d. Fine-grained porphyry.

sulted from magmatic differentiation of the lava from which the porphyry was derived is precluded by the late intrusion of the porphyry. If it is of original igneous origin at all its concentration was from a magma which cooled previous to the invasion of the porphyry. If it is of metamorphic origin, it may be connected, as already suggested, with the diorite intrusion, though from the known occurrence in other parts of Cuba, of magnetic iron ores, which are of a magnetic origin, it is possible that the Santiago ores have been formed in the same way.

An interesting feature of the iron mines is the occurrence of copper pyrites in the form of impregnations of the narrow dikes of porphyry of the ore itself. In the locality illustrated in Fig. 4, there is a well-defined fissure between the magnetite and the marble, filled with copper pyrites, which is also disseminated in the magnetite adjacent to the fissure. None of these veins has yielded any important amount of copper ore.

From observations made by the writer in other parts of the island it seems probable that the schist series, in which the ores occur, can be correlated with other metamorphic rocks which are older than the serpentines, by which they are intruded and which underlie all of the unmetamorphosed sedimentary rocks of Cuba. The eruption of the diorite and porphyry occurred at a period previous to the Oligocene Tertiary, as shown by fossils of that age, in the strata which are younger than the igneous rocks, and which occur upon the northern slope of the Sierra Maestra.

The quantities of igneous material in the ore belt are so great that in the portion of the earth's crust which has been revealed by erosion, the mass of the invading rock now surpasses that of the enclosing formation. It is perhaps not outside of the truth to say that the schists have more of the nature of inclusions in the intruded porphyry than that they exist in the form of a matrix. See Fig. 2. No more striking example could be offered of the immensity of the telluric forces involved in the processes of igneous intrusion. A mass of many million tons weight floated upward by the buoyant effect of molten rock in motion from the interior toward the surface of the earth, is the only conception which adequately accounts for the mode of occurrence of the ore bodies of the Magdalent and Lola mines at Diaquiri, while, though less strikingly shown, at Firmeza, it is likely that the masses of schist, marble and ore have been likewise actually suspended in the molten lava.

Upon the theory proposed it is necessary to suppose that the ore bodies of the metamorphic series were originally widely distributed and of immense size, and that the ore bodies which are now found adjacent to one another, though separated by dikes or stocks of porphyry, were formerly parts of one mass. It is certainly true that the Lola and Magdalena ore bodies were united previous to the igneous intrusion, and here the two large masses of magnetite are subdivided by dikes of medium or narrow width, showing upon a smaller scale the same relations as are exhibited by the larger masses of igneous rock. The extreme irregularity of the ore bodies within the productive zone, has been the natural and unavoidable outcome of the invasion of the ore-bearing formations by igneous rock injected from below.

The original locations of the productive iron mines of the Santiago region were determined by means of the large quantities of surface ore which were found at various localities in the mineral belt. Some of these were so conspicuous that they led to very extravagant ideas on the part of the discoverers and also to over-valuation by several experts

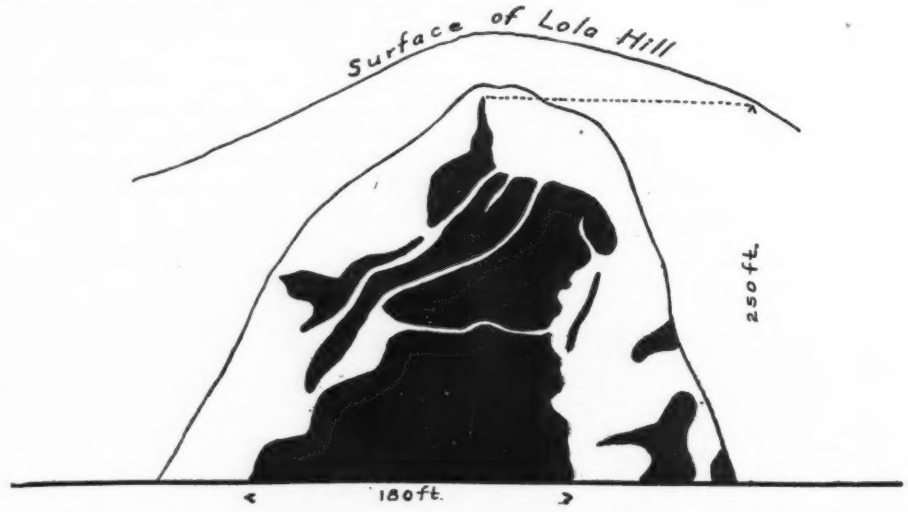


Fig. 5. WORKING FACE OF LOLA MINE, SHOWING GENERAL RELATIONS OF ORE-BODY TO ENCLOSING PORPHYRY.

who examined the properties. Nevertheless, their development has been in the main successful and the actual significance of the surface indications can now be very closely determined. The Spanish-American Iron Company in recently opening the Berraco mines has made very complete underground explorations to determine the actual amount of ore available, and has found sufficient ore to warrant the construction of more than 6 miles of railroad to gain an outlet to the docks at Daiquiri. The superficial portion of one of these ore bodies was opened by trial pits about 15 feet in depth and was estimated by the writer to cover a hill-top appproximately 150 feet square, figures which would

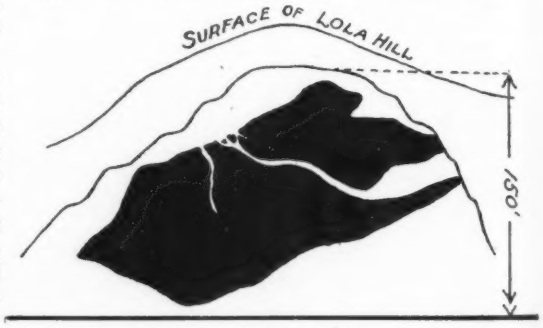


FIG. 6. GENERALIZED VERTICAL PROJECTION OF MAGDALENA ORE-BODY AT DAIQUIRI—TO ILLUSTRATE INTRUSION OF IGNEOUS ROCK.

give, according to a very rough calculation, not less than 100,000 tons of ore lying directly upon the surface of the ground.

Future explorations by the rule of thumb methods hitherto employed, can hardly prove of equal success in the future, and it is the writer's belief that careful magnetic surveys should be made of the various iron-bearing regions with a view to locating large ore bodies not indicated upon the surface, and thus prolonging the otherwise rather limited life of these important mines.

ZINC PRODUCTION IN AUSTRIA.—The offical returns give the production of zinc ore in Austria during the year 1900 at 38,243 metric tons, an increase of 1,142 tons over 1899. Of this ore 21,421 tons were mined in Carinthia. The production of metallic zinc was 6,742 tons, being 450 tons less than in 1899. Of the zinc produced in 1900 Galicia turned out the largest proportion, 3,365 tons; while the works in Steiermark turned out 2,958 tons.

THE DIAMOND DEPOSITS OF SALOBRO, BRAZIL.

By Prof. F. de Paula Oliveira.

In 1881 there was announced the discovery of extensive deposits of diamantiferous gravel in the neighborhood of Salobro, Brazil. Many parties of prospectors from Diamantina, Lencoes and Cincora left for the new fields, a large population accumulating in a very small space on the banks of the Salobrinho Stream. Diamonds abounded, and scarcely a day passed in which valuable stones were not discovered. To reach Salobro, the workers travelled for great distances, leaving the valley of South Jequitinhonha and crossing the River Pardo, and after a heavy march, they commenced clearing the brush and establishing camps at the most advantageous points.

From Lencoes, Cincora and other parts, the Babrians, with the greatest difficulty, reached the new diamond field, which was in an uninhabited country, until then unknown, and often had to fight their way against hostile Indians; some succeeded in amassing fortunes in a very short time.

The best means of reaching the deposits is from Bahia (the capital city) to Cannavieiras by sea, thence ascending the Pardo River to the village of Jacaranda, distant four miles from Salobro. This is at present the easiest means of visiting the fields.

Salobro is a remnant of the Colonial times, when it had more than 3,000 inhabitants. To-day there remain only the mounds of washed gravel, and here and there the frame of an abandoned house. The duration of the period of wealth was a short one. Smallpox, the working out of the diamonds, and finally vexatious lawsuits, were the main factors in the practical destruction of the industry.

The village lies on the Salobrinho Stream; on the other side the country is cut up by numerous valleys of the affluents of the Salobro. At the time of the discovery of diamonds, there were magnificent trees in the neighborhood of the village. These have been cut down to a distance of 1 1-2 or 2 miles from the village. The cutting of the timber probably gave the first hint of the presence of precious stones in the locality, different from other diamonds. No scientific examination was made until 1891, when Engineer Blot, despatched by the Compagnie General des Diamants, furnished many interesting data as to the deposits and conditions of exploration, but his report is very deficient in geological data.

In 1884, Prof. Henri Gorceix published in the third volume of the *Annals* of the Ouro Preto School of Mines a monograph "On the Minerals Accompanying Diamonds in the Salobro Formation." Prof. Gorceix made a special study of the composition of the gravel, which is beyond criticism; but the data which he has furnished as to the location of the deposits, which he did not visit, have induced grave errors, and recent geological investigations have proved many of his conclusions to be false. Thus he attributes to the overflowing of the Jequitinhonha the abnormality of the occurrence of the diamonds in the formations, and says that the name "Salobro" comes from the mixture of fresh and salt water, ignoring the fact that Salobro is 500 ft. above sea level. Having had occasion to pay a short visit to this locality, I am able to state the facts which I have observed without claiming that this notice is a complete study of the question. This would require a lengthened stay of several months at least in the region.

The mining at Salobro was conducted on the banks of the Salobro River, the Rico, Desengano and St. Jose brooks and other less important affluents of the Salobro, itself a tributary of the Una River. The mountainous region is of a very broken character and constitutes the foothills of the Serra do Itaraca, a spur of the Serra do Expinhaco, and divides the waters of the Pardo and Una rivers. From this (the Serra do Itaraca) run the Oura, Salobro and Preto rivers, the headwaters of which are also diamantiferous. Into the Pardo River run, west from the Criminosos Creek, which takes lower down the name of the Boi Creek, the Verde River and its affluents, also diamantiferous. The region west of the village of Salobro is only known for 5 or 6 miles. It is a district of virgin forest, yet peopled by aboriginal Indians. Everything leads us to suppose that future explorations will result in the discovery of diamantiferous deposits of value fully equal to those already explored.

The Pardo River from the headwaters to the neighborhood of Jacaranda runs approximately east, forming numerous and violent rapids and cascades, and receiving its affluents, the Verde, das Dedras and other rivers which at different levels run from the Serra. In the same way the rivers Salobro, Salobrinho do Ouro, Preto and others run an extremely broken course, until they arrive at the level of the Una River, which, like the Pardo, is tidal to far above its mouth. The Jequitinhonha runs into the sea far to the south of Cannavieiras, and consequently, south of the Pardo River, and it is wrong to consider the two rivers as united before reaching the ocean. It is true that the River Salsa receives increment from the Jequitinhonna by way of a "furado" called the Poassie, and on its way joins and crosses the Pardo. This is a very common phenomenon in Bahia, in the marine districts slightly above sea level, where the land is of a swampy nature.

The lack of reliable maps adds enormously to the difficulty of arriving at conclusions on geological phenomena throughout a great part of Brazil, and it is much to be desired, in all similar researches, that at least a reconnaisance survey should be made by rapid methods, which would give an idea of the topography.

On the mineralogical side of the question, little or nothing is known of the head waters of the Pardo and of the streams which flow down from the Serra do Itaraca to that river and to the Una. The mineralization is known only in the neighborhood of Salobro, and the diamonds are for the most part found in beds of naturally concentrated gravel, accumulated on the margins of this stream and its tributaries. When they had exhausted these deposits, the workers commenced to work on the gravel beds lying at the foot of the low hills of the district, which are overlaid by a bed of red argillaceous alluvium ranging from 3 to 90 feet in thickness. The "garimpeiros," or workers, not having at their disposal any great resources, attacked the lower portions only of this sub-alluvial gravel where the superincumbent soil measured only 12 to 15 feet in thickness. Fighting against the frequent floods, which often covered the country with a sheet of water, gained for the district the name of Lagoa Dourado. They were obliged to limit their operations to small excavations, and never reached the lower levels of the diamantiferous strata. It is difficult, therefore, to judge of the extent and character of these deposits, which appear to cover a large area, and to crop out at the margins of all the small streams as a prolongation of the lower level of the local red alluvium. At many points one encounters large masses, some continuous, some detached, of a cemented conglomerate, much resembling that of the Grao Mogol in Minas Geraes, and of the region of Sopa, near Diamantina, not alone in its composition, but in its extreme hardness. Close to this conglomerate one encounters in places outcrops of an eruptive rock, almost black in color, which should be classified as a variety of diabase or augite-porphyry. The structure is compact, finely granular, extremely hard, and gives by decomposition the red argillaceous earth which covers the gravel-beds.

It is difficult to know the connection between this rock and the conglomerate; whether it was formed in hollows left by decomposition of the diorite, or if the eruptive rock is later than the primeval gravel. and became subject to the slight metamorphosis which we note in this conglomerate. Either of these hypotheses might be accepted, after the depositing of rock which forms the overlay of the gravel beds or of the inferior layers of the conglomerate. In so irregular a region, the strong and continuous erosive action produced by torrential waters descending from the upper levels of the mountains must have been the most active factor in filling of the valleys with detritus of the heavier constituents of the original rocks, and among these the diamonds; while the lighter bodies have been carried to the bed of the Una and thence to the sea.

During many centuries natural processes have accumulated the riches, which the garimpeiros of 1881 acquired with ease. It is impossible to know whence they came, but the similarity of appearance of the conglomerates here and those of the other diamond fields such as Serra Frio in Minas Geraes, makes it credible that the diamond comes from this origin, which may possibly be secondary. The conglomerate or breccia occurs in all the formations (Jazidas) of importance in Diamantina, such as Sopa, Boa Vista, Curallinho, etc., in the neighborhood of Grao Mogul, Boi Brook, Itacambirussu River, Sacco dos Veados and other diamantiferous localities.

No data are available to guide us to the richness of the Salobro deposit. The diamonds are found very irregularly disseminated, obeying no known law, chance being the only guide to the rich pockets. From this we see that the probabilities of paying explorations lie in the location of deeper hollows formed by erosions in the red alluvium, where the gravel is least covered. Still, here the alluvium or barren ground has a thickness of from 3 to 16 feet. In the gravel we encounter various formations, quartz fragments and monazite, the mineral which is the valuable constituent of the celebrated sea-sand of Pardo and of almost all this coast. It is of little use to attempt to discover the origin of the diamond by studying the local formations. These are the product of erosive action on many different rocks, the heavier constituents and those most refractory having been deposited along the courses of the rivers and brooks of the locality, while the lighter have been carried out to sea. The so-called "satellite" also is not necessarily an indication of the presence of diamonds or of their greater abundance; we have seen localities in which were all the orthodox indications, but which were absolutely barren, while others without any indication whatever, were of extreme richness, such as the Serra do Pagao, Sao Jodo de Chapada, Grao Mogol, Saccodo Veado in Minas Geraes, etc., where the gravel consists of fragments of hyaline quartz called "dente de cao" (dog teeth) or of simple sands with oxide of iron, and microscopical crystals of monazite, titanic acid, etc.

The most salient fact in regard to the deposits which we have visited is the presence of quantities of conglomerates or breccias formed of fragments of more or less decomposed rocks, reduced to clay more or less colored (Sopa, Boa Vista, Sao Joao de Chapado, Aguas Sujus); of disaggregated rocks forming pockets of sand, which are easily broken up of a combination of the clay and sand formations; or of hardened conglomerates constituting veritable breccias, solid and of extraordinary dimensions, called by the miners "frozen soup." These occur in the environs of Diamantina, where often the metamorphosis is extremely well shown, in Boa Vista, Curralinho, Grao Mogol in Minas, and Salobro in Bahia.

Not having occasion to visit the deposits of Lavras Diamantinas we can only repeat the words of Engineer Henri Barbinsk in his report on this interesting region, wherein he mentions the presence of the same conglomerate, called by the Garimpeiros "cascalhao" (a superlative form of the Portuguese word for pebble). Lavras is said to have the richest and largest diamond deposits of Brazil, and Barbinsk, who studied them most carefully, says that here the conglomerate blocks are abundant, as well as at Sao Antonio in the Brejao locality where the "cascalhao" attains 33 feet in thickness. In Sao Joao de Paraguassu he found projecting ridges of the "cascalhao" of great size.

Prof. Derby, one of the most conscientious and competent geologists who have studied Brazilian petrology, also affirms—on information received from Theodoro Sampaio—that close to St. Isabel, Paraguassu and Leoncoes in the diamantiferous region there exists a similar conglomerate. We are also

informed by Dr. Alberto do Mendonca that in the cultivated district of Abaethe, in Mathias Jose, Minas Geraes, at a short distance from the river, the conglomerates are abundant, consisting of an argillaceous matrix and fragments of quartz. In Parana, according to Prof. Derby, in the diamantiferous region of Tibagy there exists a marl full of pebbles, which extends throughout the district.

We know nothing of the other diamantiferous districts of Brazil, but from the few observations here recorded we may draw the following conclusions: From a consideration of the deposits of Aguas Sujas, Salobro and Bagagem, we see that diamantiferous regions may present a very different appearance from those characteristic of Diamantina, Grao Mogol, etc. The barren and unproductive aspect of a country formed of itacolumitic marl and quartzite is not necessarily an indication of the presence of diamantiferous deposits, and to prove this assertion, it is sufficient to visit localities where the diamond does not exist, but the external and general aspects closely resemble those of the rich districts of Diamantina and other parts of Minas. In these districts, which are diamantiferous, there is under the quartzites or marl a layer of conglomerates, which is often so metamorphosed and adherent to the primary formation as easily to be confounded with them. The intimate relation has caused different geologists to confound the two series, distinct as they are, not having the same color, aspect and physical character. The credit is due to Prof. Derby of having first called attention to this fact, and of making a detailed study of these two rocks.

There are then conglomerates which occur in the diamantiferous regions in the Bahia quartzites, in the Abaethe schists, in the granite and mica schists of Bagagem and Agua Suja and in the schists, clays and augite porphyrys of Salobro. We think that the presence of these conglomerates or breccias is one of the most important indication of the probability of the presence of diamond deposits, and far more easy to perceive, than the formations of which the occurrence depends on local circumstances, is variable, and often gives entirely negative indications. This conglomerate is composed either of decomposed felspathic rocks or of siliceous rocks which by their natural character have resisted for a longer time the disintegrating action of time and which have a physical appearance different from the first, without having lost the character of conglomerates.

The possibility of encountering a remunerative deposit is proportional to the character and dimensions of the conglomerate, and that of the brooks, streams and rivers which traverse the district which is usually of the red alluvium, which makes the conglomerate, and fills the intervals between the blocks and contains deposits of cascalhao enriched by the disintegration of the conglomerate.

Almost the whole of the Serra do Espinhaco from Mindo to Bahia, and its spurs, is covered by a bed more or less thick of the conglomerate; the valleys of the brooks and rivers which flow thence should contain deposits of diamonds. In the region west of Salobro, in the upper reaches of the Pardo and Una, may be expected new and important deposits of this formation and also at the sources of the neighboring streams Comandatuba, Maruim Cachoeira, Salgado, Itahype, Grunugy, Salinas and others of the State of Bahia which rise in the spurs of the Serra do Espinhaco.

Finally the diamantiferous deposits are but slightly known in this region, and are without that exact scientific study which is required as a guide to explorers.

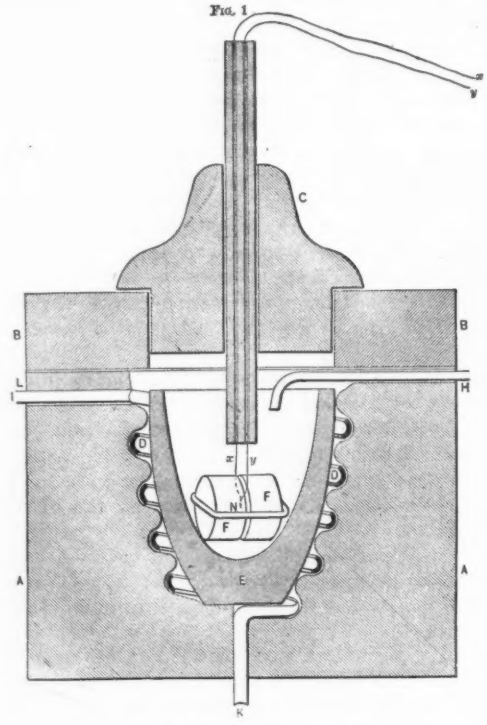
LEAD IN AUSTRIA.—In the year 1900, the mines of Austria produced 14,314 metric tons of lead ore, of which 10,904 tons were from the mines of Carinthia. As compared with 1900 there was an increase of 735 tons. The output of metallic lead was 10,650 tons, an increase of 914 tons over 1899. In addition to metallic lead a production of 1,288 tons of litharge is reported, being 239 tons less than in 1899.

AN ELECTRIC-RESISTANCE MAGNESIA CRUCIBLE-FURNACE FOR LABORATORY USE.*

By Henry M. Howe, Ph.D.

One of the little electric-resistance magnesia crucible-furnaces which I designed for the metallurgical laboratory of the School of Mines of Columbia University is shown, in vertical section in Fig. 1. The furnace itself consists of two semi-cylinders of magnesia, A A, with a cover of magnesia, B B, and a stopper, C, also of magnesia,

Fig. 1.



ELECTRIC CRUCIBLE FURNACE.

which is perforated to admit the leads x, y, of a thermo-electric couple. The furnace is heated by the spiral of platinum wire, D D (entering and departing by the openings I and K), through which a current of any desired strength is passed, bringing it to incandescence, and to any temperature, not above the melting-point of platinum, which may be desired. The crucible E, actually used in this furnace, is also of magnesia.

I have heard of some unsuccessful attempts with furnaces of this general class, and have attributed these failures to the use of siliceous materials for the furnace-walls. Of course such a result is what we should expect, since the silica would readily be electrolysed by the current, and the resultant silicon would alloy with platinum; but the little magnesia furnace here described seems to be wholly free from this objection. It has been used in my laboratory for some months, and temperatures up to 1,100° C. have been developed in it over considerable periods of time—indeed, it has been held near 1,400° C. for about two hours—without indication, thus far, of any deterioration of the platinum.

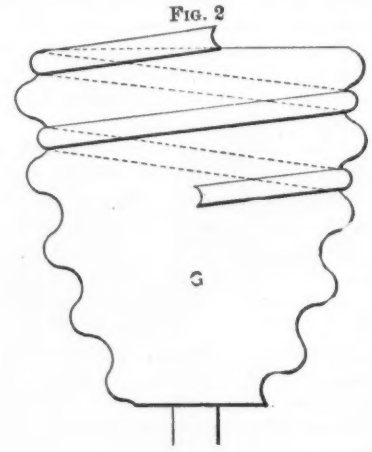
In the section shown, F F are a pair of steel disks, bound together, but separated by the inverted thermo-junction, N, of the thermo-electric pyrometer. This arrangement permits the observation and record of retardations in the heating and cooling of F F—in other words, the determinations of the cooling curves of steel—a purpose for which the furnace has been used, thus far, more frequently than in the determination of melting points. For the latter operation, however, it is also suitable. Indeed, it was originally designed for use in calibrating thermo-electric couples by means of the melting-point of copper. For this purpose, the method described by Holman had been found upon repeated trial to be unsatisfactory, because of the liability of the copper to oxidation; and this apparatus was devised to permit the crucible to be filled with an atmosphere composed of equal volumes of carbonic acid and carbonic oxide—a gaseous mixture which does not oxidize copper, and, at the same time, is unlikely to cause deposition of carbon.

In such an operation, the mixture of carbonic acid and oxide, or any other desired atmosphere, is introduced through the pipe H, which, as well as the openings I and K, may be tightly packed, while the cover, C, is luted on. Absolutely air-tight closure, however, is not required, since a gas-pressure through H sufficient to maintain a plenum in the crucible, and to offset small leakages, will be a sufficient prevention of change of the interior atmosphere. As already observed, AA, BB and C are magnesia. L is packing.

Besides the uses described the furnace lends itself to a great variety of purposes—as, for instance, when it is desired to reach quickly and accurately a desired temperature, or to hold a small object for a long time at a given temperature, and especially when we wish to avoid an atmosphere containing the products of combustion of any fuel. In order to increase its radiating surface, the spiral D may be made of a special U-shaped wire, like that employed for the ribs of umbrellas. What we have actually used, however, has been simply a pair of wires of 0.04 inch diameter (No. 14, American wire-gauge), twisted around each other. To facilitate placing the spiral in its groove within the furnace, I devised the mandrel G, shown in Fig. 2. The mandrel, with the wire wound upon it, is set approximately in place in the furnace; the mandrel is then withdrawn by screwing it to the left; the two halves of the furnace are at the same time pushed together; and the wire is thus fitted into the spiral groove made for that purpose in the furnace walls.

As to the material of the wire, I am informed that, for temperatures up to 1,200° C., nickel wire serves well for heating by resistance. Some of the new high-resistance alloys also should be available for this purpose at moderate temperatures, and would be, of course, much cheaper than platinum. It is reported that platinum volatilizes somewhat rapidly at 1,350° C., though without correspondingly rapid loss of ductility. In the use of the furnace here described, we have noticed some indications that platinum had volatilized at or above that temperature. However, if such high heats be prudently avoided, platinum wire should last for years. M. Osmond informs me that, in connection with his thermo-electric pyrometer, he has used for many years one set of such wire. Moreover, when the wire is finally spoiled it is still platinum and can be sold as metal or remelted and redrawn as wire. The objection based on its initial high cost is therefore less formidable than if it were completely consumed in use. Apart from this item of expense (amounting for the particular furnace here described, to about $30), the apparatus is cheap, as well as simple and effective. In practice, we have enclosed the furnace in a large mass of powdered lime, to reduce the loss of heat by radiation.

Fig. 2



*Paper read before American Institute of Mining Engineers, Mexican Meeting, 1901.

The magnesia blocks required, and also the crucible, were made for me by Muller & Cie., of Ivry Port, near Paris. I am indebted to Mr. H. P Tiemann, a student in my laboratory when this furnace was introduced, for determining, by calculation and cautious experiments in detail, the current needed for the temperatures desired, and thus assisting me to avoid the fusion or injury of the platinum wire which might have resulted from tentative use not thus guided.

CHROMITE AS A HEARTH-LINING FOR A SMELTING FURNACE*

By William Glenn.

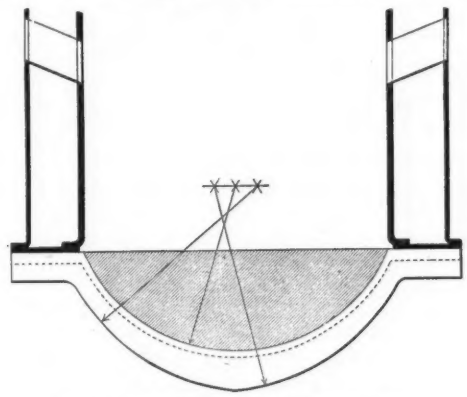
The mineral chromite (chromic-ore) is not fusible. It is not attacked by the constituents, or by any of the fusion products of copper-ore. It is worn but slowly by the flowing of dense fluids over it. When heated and cooled, it does not become friable; nor is it subject to unpleasant explosions when quickly heated to a high degree. Hence, it ought to prove an ideal mineral for the lining of a copper-smelting cupola.

At the Elizabeth Mine in Strafford, Vermont, so long ago as 1882, the writer attempted to employ it in a water-jacketed cupola copper-furnace, 48 inches in diameter. But the ore used was in the form of sand, and its grains could not be sufficiently cemented. They floated up through the matte and ran with it out of the furnace, bringing about the prompt destruction of a bottom which had been expected to prove extremely durable. In the summer of 1899 at the same mine a water-jacketed cupola copper-ore furnace of rectangular form was built, the hearth of which is 36 by 120 inches, having 14 tuyeres of 5-in. clear opening. Its bottom was made of cast-iron plates, held up by jackscrews, and protected by a covering, 12 inches deep, of fire-bricks. The basic slags, with the matte, would find channels through the fire-bricks, and thereafter the region of the channels would have to be kept cool by a spray of water until the end of the week, when the time came to renew the bottom. The work had come under the management of Mr. Jas. W. Tyson, Jr., who believed he could construct a chrome-ore bottom which would not float in the slag or regulus, and would last indefinitely, or at least for many months. To contain the chrome-ore, and form with it the furnace-bottom, he constructed a cast-iron basin, with surrounding flange, the outer edges of which coincided with the exterior walls of the water-jacket. Fig. 1 represents a vertical section, passing through two of the tuyeres of the water-jacket, and through one of the ribs which reinforce the basin. As will be seen, the bottom of the basin is an inverted arch of 36-in. chord and 12-in. versed sine, and 1 inch in thickness (as shown by the dotted line) except the flanges, which are 1.5 inches thick. It is in two sections, each of which is 5 feet 7 inches long. Each section is reinforced by three ribs, 1 inch in thickness and depth as shown in the figure, by means of two of which the sections were bolted together, with an asbestos gasket in the joint. The two outer ends of the basin were closed by segments, of the form shown by the diagonally shaded part of the figure, which were cast with the sections. The basin was supported by 10 jack-screws (not shown in the figure), placed under its flanges, and thus held securely up against the bottom of the water-jackets, leaving free for inspection the entire under-side of the basin. The chrome-ore was filled into the basin, as shown by diagonal shading in the figure, just filling the basin, and reaching no higher than the bottoms of the water-jackets which form the four walls of the cupola. The ore used was of all sizes, from 10-in. cubes, and downward through all dimensions even to dust.

Mr. Tyson says that "the lumps of ore were fitted in as well as possible, the interstices filled with smaller lumps hammered in, and finally the cracks were filled with ground ore." He lays stress on the fact that the ore was well compacted, and that positively no perishable cementing material was employed. Apparently, he lays stress also upon having laid a course of fire-bricks on end over the whole of the chrome-ore hearth, providing a depth of 8 inches of brick to be dissolved before the fused materials could reach it; thus permitting the hearth to heat slowly, and, as he supposes, "to glaze over" before it could in turn be attacked. The capacity of the furnace is considerably beyond 150 tons of ore daily.

The ore in the cupola bottom is Turkish, and contains 52 per cent of chromic oxide. There is no apparent reason why 44 per cent ore would not be equally serviceable; and it is more available. Such ores may be had in San Francisco of the mineral brokers, and also in the Black Lake region of Quebec.

The chromite cupola-bottom above described seems to have suffered no degeneration down to June, 1901. The blister-copper furnace mentioned was not originally built precisely as above outlined. But later, its bridge-wall was constructed entirely



CHROMITE FOR FURNACE LININGS.

of chrome-ore; and this has suffered no degeneration as yet noticeable. Still later, the slag-line of its hearth was built around with chrome-ore, and this also has withstood all attacks upon it.

Our experience leads us to believe that the bridge-wall of a blister-furnace should be lined with blocks of chrome-ore, compacted as far as possible, and that the slag-line of the furnace-hearth should be formed of blocks of chrome-ore about 10 inches in height. We would build the larger blocks into the walls, as best we could, and then wedge the smaller ones in among them. The work would appear rude and unskillful when looked upon after completion. Blocks of chrome-ore are rough in outline; they do not readily lend themselves to wall-building; and it is a waste of energy to attempt any shaping of them. There is no mortar, wherewith to form an inviting exterior to the work; and there is no other deceitful adjunct present.

*Abstract of paper read before the American Institute of Mining Engineers, Richmond Meeting, 1901.

TEXAS OIL AS LOCOMOTIVE FUEL

Inquiries made into the question of the use of fuel by the *Railroad Gazette*, of New York, show that a number of roads in the Southwest are seriously considering the use of Texas oil for locomotive fuel, while a few roads now have some oil-burning locomotives in service.

The Kansas City Southern has two locomotives equipped for oil, but these have only been in use a few weeks, and not much is known yet about their performance. However, they are said to steam well.

The International & Great Northern has been experimenting with fuel oil in locomotives, and oil-burning passenger, freight and switching engines are now in service and giving good results. It is thought that in the near future all engines on the Gulf Division of this road will be equipped for burning oil. Mr. F. Hufsmith, the superintendent of motive power, says that at present prices there is a saving of about 20 per cent in favor of fuel oil and roads running directly into the oil fields make a still larger saving, having no freight to pay on the oil. His opinion is that fuel oil will be universally used by the roads in that section of the country if present conditions prevail. Mr. Hufsmith considers the following the chief advantages of oil over coal-burning engines: There is no danger of setting out fires along the right-of-way and no need to clean fires at terminals; there are no cinders to be handled and the annoyance to passengers from cinders and smoke from the locomotive is overcome.

The Gulf, Colorado & Santa Fe has 15 engines converted from coal to oil-burning engines and experts to convert 75 engines as soon as possible. This road apparently has its plans more definitely made than the other Texas lines. The economy in using oil instead of coal is found to range from 25 to 40 per cent, the latter figure being obtained near the oil-fields where the price of coal has been high. The former figure applies near the source of the road's coal supply.

The Southern Pacific expects to equip for oil burning the locomotives on its Louisiana lines and on its lines in Eastern Texas. The apparatus will be similar to that now used on Southern Pacific locomotives distributed between Oakland, Cal., and El Paso, Texas. With reference to the Pacific System, which has used fuel oil for a number of years, Mr. H. J. Small says that 149 locomotives are now equipped to burn oil.

The Mexican Central has made drawings for oil-burning apparatus suitable for its locomotives, but as yet nothing has been done in the way of changing its engines.

Besides these about a dozen small roads in Texas say that oil fuel will probably be used on their locomotives, if the roads now experimenting with the Texas oil are successful.

COAL MINING IN NEW ZEALAND.—The report of the New Zealand Minister of Mines for 1900 says: "For the first time in the history of the colony the year's output of coal and lignite exceeds 1,000,000 tons. The gross output for twelve months ending December 31, last, was 1,093,990 tons, made up as follows: Bituminous and semi-bituminous coal, 673,862 tons; pitch coal, 37,804 tons; brown coal, 339,786 tons; and lignite, 42,538 tons. Compared with the gross output for 1899, the production for last year showed an increase of 118,756 tons.

ELECTROLYTIC CHROMIUM.—The *Journal* of the Franklin Institute, Philadelphia, for November, says: "With a divided cell containing a chromic salt at the cathode and an acid or saline solution at the anode, good deposits of chromium can be obtained on a carbon cathode, or on platinum, brass, lead, etc., according to the experiments of Neumann, which were published in *Zeitschrift für Elektrochemie*. With chromic chloride solutions containing 10 per cent chromium, a current density per square decimeter of 0.9 ampere gave only oxide, 1.8 to 7.2 amperes gave oxide and metal, 9 to 18 gave pure metal, in the latter case mostly crystalline, with a current efficiency in densities 9 and upward of about 38 per cent. Increase of temperature hardly affects the current efficiency, but above 50° C. the metal deposits as a black powder. A strength of 16 per cent Cr. in the solution gives a yield of 57 per cent, increased to 89.5 by altering the anode solution. With chromic sulphate the best conditions are 6.7 to 8.5 per cent Cr. and 13 to 23 amperes per square decimeters, giving 84.6 to 86 per cent efficiency. Acetate does not work well. The deposits are bright gray and lustrous, but have a tendency to peel off, due to films of oxide. They are hard and brittle and very pure, containing only 0.1 to 0.2 per cent of iron, and, like ordinary chromium, occur both in active and passive states. The decomposition potential in chromic sulphate of five times normal strength is 1,898 volts, in the chloride 8 times normal 1,685 volts, but it is necessary to use at least double this electromotive force."

ABSTRACTS OF OFFICIAL REPORTS

Chillagoe Railway and Mines, Queensland.

The sixth semi-annual report submitted to the stockholders' meeting on September 3, covered the six months ending April 30, 1901. The company is capitalized at £1,000,000 in £1 shares fully paid up. The mining property consists of five groups of mines, namely, Red Cap, Zell-Mauton, Ruddygore, Calcifer, Ti-Tree. The Mungana group was sold to the Mungana Company on March 31, and the report covers the management of these properties only from November 3, 1900, to March 31, 1901. Satisfaction is expressed by the directors at the fact that the railway, the most important work undertaken by the company, has been completed and is ready for traffic. The length of the line is 102½ miles. In its building and equipment the company has expended £382,590. At present the railway is the only source of revenue. The smelting works were nearly completed and it was expected that some of the furnaces would be put in blast before the first of October. Expenditures on the part of reduction works amounted to £58,795.

Since the last meeting a change in the management of the properties had been effected, Mr. Alexander Stewart having retired from the position of general manager to that of consulting engineer. Mr. E. A. Weinberg was made general manager and Mr. Fred Bach, managing director. By these changes a saving in salary of £2,500 a year had been made. Mr. Weinberg shortly after taking charge reported to the directors that the estimates made by Mr. Stewart as to the quantities and values of proved ore were greatly exaggerated. How much is not stated, as Mr. Stewart had been prevented by illness from making a new examination and revising his figures. An independent report will be made by an expert sent by the company to examine the property. The expenditures made on account of developing the mines has amounted to £140,475.

Philadelphia & Reading Coal and Iron Company.

This company owns a great coal estate in the anthracite region of Pennsylvania. It is controlled and practically owned by the Reading Company, which also owns the Philadelphia & Reading Railroad. In the balance sheet the property is valued at a total of $94,690,966, of which $8,000,000 is represented by capital stock, $5,519,000 by mortgage bonds, $78,798,654 by advances made by and due to the Reading Company, and the balance by current liabilities. The report covers the year ending June 30, 1901.

The statement of coal mined during the year is as follows, in long tons of 2,240 lbs.:

	By company.	By tenants.	Total.
From lands owned	6,697,122	1,118,214	7,815,336
From lands controlled	326,898	118,824	445,722
From other lands	992,916	.....	992,916
Total	8,016,936	1,237,038	9,253,974
Total, 1900	8,031,951	1,187,814	9,219,765

The total increase shown last year was 34,209 tons, or 0.4 per cent. The statement of coal sales during the year is given below, also in long tons:

Coal mined by company, as above	8,016,936
Coal purchased by company	967,435
Decrease in stocks during the year	116,145
Total sold	9,100,516

Of the coal reported as purchased 689,904 tons were bought from tenants of the company and 277,531 tons from other parties. The coal on hand June 30, 1901, is reported at 424,806 tons.

The income account for the year may be summed up as follows:

Coal sales, anthracite		$27,697,104
Coal sales, bituminous		807,358
Rents received		340,772
Interest, dividends and miscellaneous		72,624
Total receipts		$28,917,858
Operating expenses		27,106,644
Net earnings		$1,811,214
Fixed charges and taxes	$369,315	
Interest (1½ per cent) on Read'g Co. loans	886,504	
		1,255,819
Balance		$555,395
Balance from previous year		280,253
Total credit to profit and loss		$835,648

The average receipt for anthracite coal sold was $3.04 per ton. The tonnage of bituminous coal sold is not given in the report.

The expenses for the year may be stated as follows:

Mining coal, including repairs	$12,431,978
Royalty on coal from leased lands	482,057
Taxes, repairs, etc.	303,828
Colliery improvements	806,308
Depreciation fund, coal lands	413,053
Coal purchased, anthracite	1,729,758
Coal purchased, bituminous	816,727
Coal sold from stock	1,016,990
Total expense for supplying coal	$18,000,699
Transportation of coal by rail	$6,558,759
Transportation of coal by water	1,207,248
Handling coal at depots	387,502
Commissions and other expenses	952,436
Total expense for marketing coal	$9,105,945
Total	$27,106,644

It will be seen that the cost of mining and supplying coal was 66.4 per cent of the total expense, and that of marketing coal 33.6 per cent. The average cost of anthracite coal purchased was $1.79 per ton.

The coal carried by the Philadelphia & Reading Railroad during the year and the earnings therefrom are shown in the following table, in comparison with the previous year:

	1900.	1901.	Changes.
Anthracite	10,672,556	10,523,891	D. 148,665
Bituminous	4,539,719	5,018,491	I. 478,772
Total coal carried	15,212,575	15,542,382	I. 530,107
Coal ton-miles	1,643,836,143	1,703,914,695	I. 60,078,552
Average haul, miles.	108.06	109.63	I. 1.57
Coal car, mileage	146,015,485	154,790,680	I. 8,775,195
Average load, tons	11.26	11.08	D. 0.18
Coal traffic earnings	$11,371,203	$12,391,307	I. $1,020,104
Avr. pr. ton-mile, cts	0.6920	0.7272	I. 0.0352

Water shipments from Port Richmond during the year included 1,849,250 tons of anthracite and 1,024,874 tons of bituminous coal. The earnings of the company's fleet of steam colliers and barges during the year were $1,278,299, and the expenses $817,263, showing a profit of $461,038.

The operations of the miners' beneficial fund show receipts of $120,155 from 25,541 contributors and $1,100 from interest, a total of $121,255. The payments included $78,603 to 3,840 contributors for injuries received; $28,179 to families of 158 contributors killed; $264 for dues refunded; a total of $107,046, leaving a balance of $14,209 for the year. On July 1, 1900, there was a debit balance of $24,397, which was therefore reduced to $10,188 on June 30, 1901. There are now in the endowment fund $10,000 in 4 per cent bonds and $10,000 in 7 per cent bonds, producing a yearly income of $1,100.

The report says: "The total production of anthracite coal from lands owned and leased by the Philadelphia & Reading Coal and Iron Company in the year 1900-1901 was 9,253,974 tons, an increase of 34,209 tons over the production of the previous year, the production of the whole region having decreased in the calendar year 1900 about 5.4 per cent, from the production of the year 1899. The decrease in the production of the whole region resulted entirely from the strike of the miners in September and October of the year 1900. The coal purchased aggregated 967,435 tons, a decrease of 158,032 tons, or 14 per cent, and the sales amounted to 9,100,516 tons, a decrease of 278,911 tons, or 2.9 per cent from the previous year. The cost of coal mined and purchased for the year was $1,823, which is 15.6 cents higher than the cost for the previous year. This increased cost resulted from the increase in wages of employees, taking effect from October 1, 1900. The collieries and all their appliances are in thoroughly good order. The total sum expended for colliery improvements, etc., for the past fiscal year was $806,308, as against $750,499 for the previous year. All work done at the collieries and all additions to their structures and also the improvements at the company's shops at Pottsville have been charged to the cost of coal.

"The funded indebtedness of the Coal and Iron Company has been reduced this year by payments on account of the principal of the following loans: Divisional mortgage bonds, $20,000; collateral sinking fund loan, $71,000; bonds and mortgage on real estate, $62,000; leaving a balance still outstanding of divisional mortgages $380,000, the larger part of which mature in 1904; of collateral sinking fund loan, $1,484,000; and of bonds and mortgages on real estate, $55,000. These bonds were paid by the issue of general mortgage bonds, and credit was given to Rading Company for the amount issued. The general mortgage requires the Reading Company to create a sinking fund of 5 cents a ton on all coal mined before the payment of dividends; but it was heretofore determined to set aside annually an additional 5 cents on each ton mined so as to make reasonable provision against the depletion of the company's estate. In furtherance of this policy the sum of $413,053 was set aside from the earnings of the company for the fiscal year. This sum was not invested at the close of the fiscal year, and therefore is included in the item cash on hand on the balance sheet of the Coal and Iron Company. The total sum of interest-bearing securities and cash in this fund is $1,191,054. It will be used from time to time for the acquisition of additional coal properties and the construction of collieries whenever such acquisition or construction is considered essential to the business interests of the company, and for the several business necessities of the company not otherwise provided for. An agreement was made during the past year under which the extension of the collateral sinking fund which matures February 1, 1902, has been guaranteed. Under this agreement the date of the maturity of the bonds is extended to February 1, 1932, the interest is to be reduced from 5 to 4 per cent per annum, and the sinking fund is to be reduced from an average of $72,000 per annum to the fixed sum of $30,000 per annum."

IRON ORE IN ITALY.—Official returns show a total of 247,278 metric tons of iron ore mined in Italy in 1900, against 236,549 tons in 1899; an increase of 10,729 tons.

SAULT STE. MARIE CANAL TRAFFIC.—A full summmary of the commerce of the canals at Sault Ste. Marie (Canadian and United States) to November 1 is not yet at hand, but the figures available show a total of 4,174,545 tons of freight moved through the canals during October. This exceeds the traffic of the corresponding month last year by nearly 1,000,000 tons. The commerce each month during the past five has exceeded the 4,000,000-ton mark, and the total at the end of October was 24,543,610 tons, which is within 100,000 tons of last year's total for the full season. The iron ore shipments through the canal in October were 2,699,242 tons.

MINE ACCIDENTS IN NEW ZEALAND.—The report of the Minister of Mines of New Zealand for the year 1900 gives the following statement of fatal accidents in the mines of the colony during that year:

Class.	Employees.	Deaths.	Deaths per 1,000
Quartz mines	4,267	4	0.93
Placer mines and dredges	9,235	8	0.86
Coal mines	2,460	4	1.62
Total	15,962	16	1.00

The report says: "Investigation of these fatal accidents showed that in one instance, where the manager was killed along with two of his men, reasonable precautions had not been observed. In the case of the dredge employee, who was drowned, it was found that the regulations made for the safety of persons employed had been disregarded. A prosecution for breach of regulations followed, but the charge was dismissed on technical grounds. The decreased percentage of fatalities in proportion to the number of persons employed, and especially in relation to dredging, is a very pleasing and satisfactory feature."

RECENT DECISIONS AFFECTING THE MINING INDUSTRY

SPECIALLY REPORTED.

DUTY ON CRUDE EARTH FOR COLORS.—An unwrought earth which is used as a color is dutiable under paragraph 58, act of July 24, 1897. The provision for colors is the narrower and more limited provision and must prevail over the general provision for unwrought earth.—Appeal of Spencer Optical Company from Collector of Customs at New York; Board of General Appraisers.

DRAWBACK ON ASBESTOS CEMENT EXPORTED.—On the exportation of King's Windsor asbestos cement, manufactured by J. B. King & Co., of New York City, in the manufacture of which is used, among other ingredients, plaster of paris made wholly from imported rock plaster, a drawback will be allowed equal in amount to the duty paid on such imported material used, less the legal deduction of 1 per cent. In liquidation, the quantity of plaster of paris which may be taken as the basis for allowance of drawback may equal the quantity declared in the drawback entry after official verification of exported weights, but in no case shall it exceed 80 per cent of the net weight of the exported article, which shall be taken at an average not to exceed 280 pounds net per package. To the weight of the plaster of paris appearing in the exported cement may be added 15.6 per cent to compensate for loss incurred in the manufacture of the same from rock plaster as imported. —Circular of Treasury Department.

RIGHT OF RAILROAD COMPANY TO CROSS MINING LAND.—A railroad company sought to condemn a right of way over the property of a mining company which owned and operated a short railway in such manner that the tracks of the new road and that of the mining company would run parallel, and it would be 14 feet from the center of one track to the center of the other. The shaft to the mine was from 56 to 72 feet from the strip of land sought to be condemned, and the main track, switches and loading tracks of the mining company were on the strip of 56 to 72 feet, which was between the strip sought to be appropriated and the mining shaft. It was held by the court that the appropriation of the right of way desired by the railroad company would not materially interfere with the operation of the mine, so as to preclude a right of condemnation of the required strip. The fact that the right of way might just as well be located on the land of another coal mining company, whose officers and stockholders are the same as those of the said railroad company, and which will furnish the bulk of the business of the railroad company, is no defense, since a railroad company is given by the Legislature the right to select the location it prefers for its right of way.—Kansas & Texas Coal Railway Company vs. Northwestern Coal and Mining Co. (61 Southwestern Reporter, 684) ; Supreme Court of Missouri.

BOOKS RECEIVED.

In sending books for notices, will publishers, for their own sake and for that of book buyers, give the retail prices. These notices do not supersede review in a subsequent issue of the ENGINEERING AND MINING JOURNAL.

American Mines Annual. Compiled by George E. Vigouroux. New York; George E. Vigouroux & Co. Pages, 194. Price, $5.

Compressed Air. Its Production, Uses and Applications. By Gardner D. Hiscox. New York; Norman W. Henley & Co. Pages, 822; illustrated. Price $5.

Statistical Year-book of Austria. Part 2; Mineral Production. Compiled by the Ministry of Commerce. Vienna, Austria; Imperial Printing Office. Pages, 200.

Statistics of Mineral Production in India, 1891-1900. Compiled in the office of the Director-General of Statistics. Calcutta, India; Government Printing Office. Pages, 12.

Notes on Irrigation in South Africa. By A. S. Woolley. London, England; reprinted from *South Africa.* Pamphlet, 32 pages; illustrated. Price (in New York) 20 cents.

Tasmania; Report on the Tin-mining District of Ben Lomond. By George A. Waller. Hobart, Tasmania; published by the Department of Mines. Pages, 42; with maps and diagrams.

A Treatise on Hydraulics. Second Edition, Rewritten. By Henry T. Bovey. New York; John Wiley & Sons. London; Chapman & Hall, Limited. Pages, 600; illustrated. Price, $5.

Journal and Proceedings of the Royal Society of New South Wales. 1900. Edited by J. H. Maiden and G. H. Knibbs, Honorary Secretaries. Sydney, N. S. W.; published by the Society. Pages, 480; illustrated.

Smoley's Tables. Containing Parallel Tables of Logarithms, and Squares of Feet, Inches and Fractions, from Zero to 50 feet. By Constantine Smoley. New York; Engineering News Publishing Company. Pages, 212. Price, $3.

NEW PUBLICATIONS.

Anuario Wessel de la Deuda Publica i Sociedades Anoniomas Establecida en Chile. 1901. Compiled by Carlos E. Wessel. Santiago, Chile; Wessel & Long. Pages, 232.

This little book contains a carefully prepared list of the banks, railroad and steamship companies, insurance, manufacturing and mining companies now operating in Chile. The officers, capital stock and many other particulars in relation to each are included. In the case of the nitrate companies and other mining companies some particulars are also given as to the properties owned and operated, the dividends paid and similar matters. The annual will be of much service to all who have business relations in or with Chile.

Miners' Pocket Book. A Reference Book for Engineers and Others Engaged in Metalliferous Mining. By C. G. Warnford Lock. London; E. & F. N. Spon, Limited. New York; Spon & Chamberlin. Pages, 424; illustrated. Price, $4.

This is a new edition of Mr. Warnford Lock's well known *Pocket Book.* In preparing the present volume it has been almost entirely rewritten, much new matter having been added and much other matter, which had been rendered useless by modern progress, having been omitted. The general plan of the book remains unchanged. It is not intended to be a complete treatise on mining, but rather to furnish such data as the mining engineer needs for reference in a convenient and readily used form. Such a book is necessarily in large degree a compilation, but the author seems to have taken pains to draw upon the latest and best authorities. To some extent he leans towards British practice and British mining terms, but references to American and Australian practice are not wanting.

A critical review of a book like this is difficult, and should, in fairness, be made only after it had been in actual use by the reviewer. In this case we can only say that Mr. Lock's book in previous editions has stood the test of use by many engineers, and that the changes made in the new edition seem to have improved the work and brought it fairly up to the present condition of mining practice.

The Twenty-first Annual Report, United States Geological Survey. 1899-1900 (in six parts). Part I, *Director's Report including Triangulation, Primary Traverse and Spirit Leveling.* Washington; Government Printing Office. Pages, 608; illustrated with three folder maps.

In his introductory remarks, Director Charles D. Walcott describes the work of the United States Geological Survey during the fiscal year 1899-1900 as having been carried on mainly in continuance of that of previous years as published in former reports. The same organization was maintained and in a general way similar results were reached that added materially to the sum of geological and geographical knowledge of the country.

The survey of the forest reserves was carried out in a very satisfactory manner and numerous reports were published on the amount, character, distribution and value of the timber on them. The survey of Alaska was completed and the demand for increased hydrographic work was so strong from all sections of the country that the appropriation for this work was increased for the fiscal year 1900-1901. An important change was made in the reorganization of the Geological Branch of the Survey, the new divisions with their respective heads being as follows: Areal Geology, Bailey Willis; Paleontology, T. W. Stanton; Pre-Cambrian and Metamorphic Geology, C. R. Van Hise; Mining and Mineral Resources, David T. Day; Economic Geology, S. F. Emmons and C. W. Hayes; Physical and Chemical Research, George F. Becker.

The magnitude of the work undertaken by the Survey is evident when one considers that 3,000,000 square miles of territory (exclusive of Alaska) requires to be surveyed and topographical and geological maps prepared of a suitable scale—a work greater than ever heretofore attempted by any nation. In addition to this, the Survey annually collects the statistics and studies the original sources pertaining to from $700,000,000 to $1,000,000,000 worth of mineral products, which is in itself an enormous task. In hydrographic work it investigates water powers, artesian, surface and possible storage waters and domestic water supply. The publication of the results obtained forms a contribution to the world's store of knowledge exceeding in size that of any other scientific organizations in existence. This outline of the work of the Survey gives an idea of the wide scope of its operations.

A portion of the report worthy of special mention is the schedule of topographical and geological surveys that have been made from 1879 to 1900, including a partial reference to related publications. The subjects treated are gold and silver, with associated metals, iron ore, quicksilver, zinc, lead, copper, coal, oil, gas, marble, slate, phosphate, asphalt, bauxite, marl, artesian water and reservoir sites.

In 1894 the publication of the folio sheets of the *Geological Atlas of the United States* in their final form was commenced, and about 60 of these very important maps have now appeared. A correct geological map is the first and most essential basis for the study of a mining district and where the beds are in sedimentary strata, as with coal, and sometimes other substances, it furnishes all that the mining engineer requires for opening and exploiting the mines of the district. The issue of these folio publications without waiting for the final and exhaustive report disseminates the knowledge without unnecessary delay.

It is to be hoped that the establishment of a Division of Mines and Mining within the Survey will soon be effected, as the mining and allied industries will thereby be greatly benefited in many ways. Annual reports should be made of the progress in mining and metallurgy, showing the most important advances made during the year and forecasting the lines along which future progress would probably be made. Work of this character would be of inestimable value from a commercial standpoint, as for instance, in the promotion of export trade by reports on the distribution of the economic minerals, transportation to the seaboard, methods of treatment, value at the place of production and other important information to buyers for foreign markets. The exact detail of the suggested organization and its correlation with other branches of the United States Survey as well as with the individual State geological surveys, could be well arranged by the noted experts now in charge of the various departments.

The volume concludes with an appendix of 400 pages, which details the work accomplished during the year in triangulation, primary traverse and spirit leveling. The records that appear here first in published form contain the accumulated results of several years' work and constitute by themselves a valuable contribution to the topographical knowledge of the country. Three colored folder maps are included in the report, one showing the conditions and progress of the topographical surveys for the fiscal year 1899-1900; one the astronomical location, primary triangulation, primary traverse and spirit leveling for the fiscal year 1899-1900, and the third the general progress of the topographical and geological surveys for the period 1879-1900.

The typography, paper and binding of the volume are of the best order and the proof reading has been done with the usual extreme care that is shown in all of the publications of the Survey. There is one suggested improvement, however, that will meet with the approval of all who have had occasion to consult

these reports of the Survey, and that is a change from the present unwieldy size of the volume. While the actual space filled with printed matter is but 7.5 by 4.5 inches the generous margins extend the full size of the page to 11.25 by 7.75 inches, thus making an octavo book appear in quarto clothing.

CORRESPONDENCE

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied by the name and address of the writer. Initials only will be published when so requested.

Letters should be addressed to the MANAGING EDITOR.

We do not hold ourselves responsible for the opinions expressed by correspondents.

The Institution of Mining and Metallurgy.

Sir: An objection to the incorporation of the London Institution of Mining and Metallurgy seems to be that if membership in it should become necessary to the members of the profession the members would have no right to exclude applicants for personal reasons, which seems to be an inherent right of voluntary associates. Perhaps they would have the right legally, but certainly would have no moral right to prevent any gentleman from earning his living in his own way. T. J. JOHNSON.

New York, Nov. 9, 1901.

The United Correspondence School.

Sir:—With regard to the status of students enrolled with the United Correspondence Schools as far as their relation with the Consolidated Schools is concerned, in reply, I beg to state that the new organization simply replaces the United Correspondence Schools Company as proprietor of the United Correspondence Schools, and all contracts with students of the United Correspondence Schools, the Institute for Home Study of Engineering, and the Correspondence School of Technology have been assumed, and will be carried out by the Consolidaeed Schools. Students can pursue their studies without interruption, and all payments made by them to any of the Consolidated Schools for tuition remain to their credit, just as if their original contracts had been made with, and their payments made to the Consolidated Schools.

I wish to add that since the reorganization, the schools are better able than ever to give their students prompt and efficient service, and to offer them increased facilities for pursuing their studies.

THE CONSOLIDATED SCHOOLS,
Per L. L. Poates.

New York, Nov. 8, 1900.

QUESTIONS AND ANSWERS

(Queries should relate to matters within our special province, such as mining, metallurgy, chemistry, geology, etc.; preference will be given to topics which seem to be of interest to others besides the inquirer. We cannot give professional advice, which should be obtained from a consulting expert. Nor can we give advice about mining companies or mining stock. Brief replies to questions will be welcomed from correspondents. While names will not be published, all inquirers must send their names and addresses. Preferences will of course, always be given to questions submitted by subscribers. Books referred to in this column can be obtained from the Book Department of the ENGINEERING AND MINING JOURNAL).

Distance between Levels in Gold Mining.—What is about the right distance apart of levels in a mine exploiting a quartz vein, as in an ordinary gold mine? Some advocate a distance of no more than 60 or 70 feet because, they say, of the diminished amount of staging necessary in staging out the ore. Others would not run drifts nearer each other than 125 feet —and so on.—Miner.

Answer.—It is impossible to lay down anv general rule as to distance between levels and drifts. Each case stands by itself and must be determined accordingly. There are many local circumstances to be taken into account, such as general nature of the ground, width of vein, kind of hanging and foot walls, dip or inclination of vein, and others. The supply of timber—whether abundant and cheap or scarce and dear—may also be a factor. In addition to this mining engineers may differ in opinion. Each mineral deposit, as indicated above, must be studied by itself and the question decided after getting all information possible.

Sulphur in Montana.—Can a sulphur property in Montana, near a railroad, be worked commercially? —W. H. R.

Answer.—We do not think that a sulphur mine in Montana could be made to pay at present prices. Unless there is a special local demand of which we are not aware, railroad freight rates would be too high to allow a profit.

Chromium in Iron Ore.—Is an iron ore containing from 3 to 5 per cent chromium and 40 per cent metallic iron more valuable on account of its chromium contents?—W. T. J.

Answer.—The proportion of chromium in the ore mentioned is too low to make it of any value to the makers of ferro-chrome and similar alloys, or to the makers of chrome steel. An expert writes us that "the presence of that amount of chromium will add very greatly to the cost of smelting the ore. A pig metal made from such ore and containing its relative quantity of chromium would be more valuable than ordinary pig iron; but, of course, the maker will have to find some parties who specially use it, and find also whether they would be justified in paying for the pig metal an additional amount sufficient to cover the extra cost of smelting."

To this we may add that we do not know any blast furnace using such ores as you describe. If you have any analyses of the ore it would be of interest to publish them.

Mica.—I would like to know where there is a market for mica, both as it comes from the ground and after it is cut into sheets. Can you tell me its market value in both forms? What is the refuse that is cut from the sheet used for and is there a good demand for same? Does it have to be ground or prepared in any way before there is a market for it? If so what machinery is used and where can it be had? Does the supply of mica equal the demand?—C. A. G.

Answer.—There is a demand for mica, which is very considerable, and the mines of the United States are not able to supply the demand, a large quantity being imported. Mica is not marketed in the rough state, as it is taken from the mines, but must be split into sheets or otherwise prepared before shipment. The mica scrap or refuse after cutting and splitting the blocks is usually pulverized and sold as ground mica. There is an increasing number of uses for the last named product, and an increasing demand for it, especially for boiler and steam-pipe coverings. With regard to machinery, the trimming and splitting of the blocks is largely hand work, and has not yet been done to any extent by machinery. For preparing the scrap some form of pulverizer is used; there are several which are efficient. The waste in trimming and preparing mica is very large and the proportion of scrap to merchantable sheets is very high. As to price, it is impossible to give any ground quotations, as they depend upon the size of the sheets and their quality —that is their clearness, uniform thickness and freedom from cracks and flaws. The price increases very rapidly with the size of the sheets.

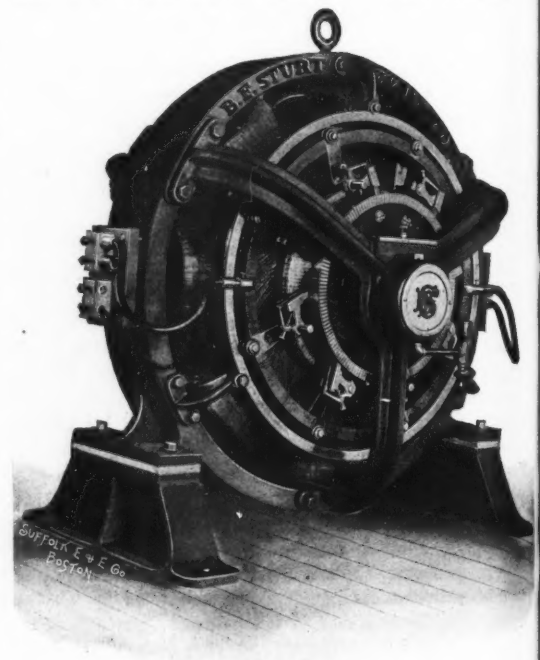
Consult *The Mineral Industry*, Volume IX, article on "Mica." Also the ENGINEERING AND MINING JOURNAL, December 8, 1900, page 662.

A NEW STURTEVANT EIGHT POLE MOTOR.

The B. F. Sturtevant Company, of Boston, Mass., has just brought out a new type of eight-pole motor, as clearly shown in the accompanying illustration. This was designed for direct attachment to a fan shaft. The field ring is of wrought iron, although in larger sizes it is made of cast steel or cast iron. The field cores are of wrought iron, with a special type of cast iron pole shoe. The peculiar size and shape of which renders the machine capable of extreme variation in load without sparking or adjustment of the brushes. Machine wound field coils are used, and the shape is such that the windings present the greatest amount of radiating surface, so that perfect ventilation results.

This type of motor was designed for comparatively low speed, but high efficiency, and, therefore, special care has been taken in the design of the armature. The coils are built up of laminated, slotted discs. These discs are solidly clamped between two brass rings, having teeth to correspond with the core teeth, which support them at both edges of the core. The teeth are not only protected in this manner, but a smooth and well rounded corner is presented for the support of the slot insulation.

A commutator of large diameter is employed, with pure drop forged copper segments. Carbon brushes



STURTEVANT EIGHT-POLE MOTOR.

with self-adjusting and self-feeding holders are employed. A tripod support upon each side carries the ring oiler bearings. These motors are built in sizes from 3 up to 137.5 horse-power.

THE PROTECTION OF STRUCTURAL IRON AND STEEL

A great deal of attention and thought is now being given by engineers, in all branches of the profession, to the problem of the proper means to be adopted for the preservation of the enormous masses of iron and steel, which are being used in ever increasing quantities for structural purposes. With the first use of iron as a material of construction, but little thought was given to the question of its protection, but the seriousness of the problem is continually becoming more evident. Its proper solution is now a matter of vital importance. Iron and steel structures, whose permanency was supposed at their erection, to be almost indefinite, are now, after a short period of years, showing such serious effects of corrosion from exposure to the weather as to very materially shorten the life of the structure itself and make extensive repairs necessary. In some cases even their safety has been impaired, and it has become necessary to replace parts with entirely new members.

With the maintenance such a large item of expense, it is but natural that the tendency of the best engineering practice should be directed towards improvement, if possible, in the quality of the protective coating, at any cost, provided permanent and lasting results are obtained. But, even at increased cost, it is hard to find a material which satisfactorily answers all the requirements of practical work. Of the many natural products which have been tried, graphite has been used very extensively. Graphite—the most inert form of carbon which is the most

unchangeable of substances—is absolutely unaffected by any acids or alkalis at ordinary temperatures. As found in nature, however, it is always mixed with impurities, heterogeneous in character and varying in amounts, which make its purification an operation involving considerable expense.

It is interesting to learn that experiments with a new graphitic product of the electric furnaces, at Niagara Falls, are already giving very satisfactory results..

Niagara Falls is recognized as one of the pioneers of the many large water power developments. The problems involved in its successful and economical development presented many difficulties, but here, too, the proper protection of the large masses of iron and steel structural work, which made its successful development possible, has already presented itself as a problem of very serious character. It would be, indeed, interesting if one of the products, in fact one of the outcomes of the Niagara Falls power development—pure manufactured graphite, a product whose manufacture has been accomplished only through the possibilities of obtaining large volumes of inexpensive electrical energy for transformation into heat in the electric furnace—should lead to a solution of this difficulty. Experiments with the pure graphite of Niagara Falls, manufactured by the Acheson process, already point to this conclusion.

PATENTS RELATING TO MINING AND METALLURGY.

UNITED STATES.

The following is a list of patents relating to mining and metallurgy and kindred subjects, issued by the United States Patent Office. A copy of the specifications of any of these will be mailed by the ENGINEERING AND MINING JOURNAL upon receipt of 25 cents.

Week Ending October 29, 1901.

685,249. SAFETY DEVICE FOR HOISTING APPARATUS.—John W. Bozarth, Dayton, Wyo. The combination with a block adapted to support suspending ropes; of safety devices comprising levers pivotally supported at opposite sides of the block and having inwardly extending arms over which the ropes are adapted to pass, and upwardly projecting arms serving as guards to prevent lateral displacement of the ropes.

685,259, 685,260. ACETYLENE GAS GENERATOR.—Giles H. Cook, Des Moines, Iowa. The combination of an air-tight cylinder, perforated partitions, a carbide holder with water supply, service and safety pipes.

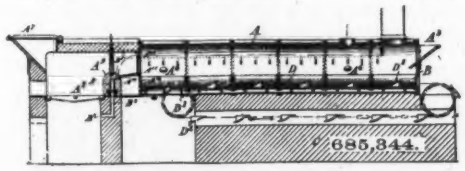
685,271. MEANS FOR GENERATING AND BURNING GAS.—Walther Glitsch, Zurich, Switzerland. A vapor generator and burner comprising an injector, superposed flaring mixing chambers, a hood above said chambers having orifices in its arched top, a burner seated axially in said top and having a flaring inlet and circumferentially disposed orifices.

685,274. ELECTROLYTIC DECOMPOSING APPARATUS.—Max Haas, Aue, Germany. The combination with an electrolyzing vessel divided in several compartments by bipolar electrodes, of a storage vessel, the first being mounted within the latter and leaving a free space between its bottom and that of the storage vessel, the top edge of the internal vessel being located beneath the top edge of the storage vessel, apertures arranged in the bottom of the internal vessel for establishing a communication of the different compartments with the outer vessel.

685,316. VALVE FOR REGENERATIVE FURNACES.—Henry C. Williamson and Gomert Powell, Michigan City, Ind. In combination, a casing having an induction conduit, two furnace conduits and a stack conduit, a reversing valve for controlling said conduits, such valve being chambered and having tubular trunnions.

685,323. ELEVATED CARRIER OR CONVEYER.—Leander Clark, Greenville, Ohio.—The combination with a trolley, wheels mounted thereon, bail shaped brackets in which the wheels are journaled, a frame secured to the brackets, angular end walls suspended from the frame, the whole forming a tapering carrier, a catch to secure the hinged wall, and means to release the catch to empty the carrier.

685,314. ROASTING FURNACE.—Elizabeth B. Parnell, Carshalton, Eng.—The combination of a longitudinal housing of triangular transverse section having a rounded top or apex, a hearth dividing the housing throughout its length into upper and lower chambers of flues, means of communication between one end of each flue and a common source of heat, a damper between the ends of the flue and the source of heat, and a chain conveyer arranged along the length of the hearth.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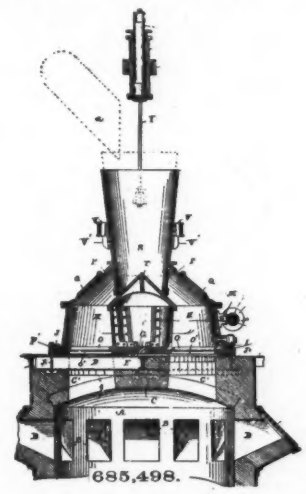
685,346. TRAMWAY DERRICK.—Byron C. Riblet, Nelson, Canada. In an adjustable derrick for wire rope tramways the combination of the sills and studs, the plate and the studs arranged to form a pyramidal shaped derrick having the plate at its apex with the bolts depending from said plate, the beam supported by said bolts depending from said plate, the cross pieces secured to said studs and the guide pieces secured to said plate and to said cross pieces, the supporting, running rope sheaves and supporting boxes secured to the ends of said beam, and the stationary rope supporting saddles secured to the ends of said plate.

685,388. AUTOMATIC DUMPING BUCKET FOR WIRE ROPE TRAMWAYS.—Byron C. Riblet, Nelson, Canada. The combination with the trolley wheel and the bucket and the pendants, of an arm secured to said bucket containing a semi-dovetailed recess at its free end and a reciprocal locking bolt connected to said pendants.

685,402. CONVERTER.—Glenn C. Howe, Indianapolis, Ind., assignor to the Ewart Manufacturing Company, Chicago, Ill., a corporation of Illinois. A conveyer chain having solid links provided with lateral openings adapted to receive slats, and intermediate links made of separable sections and having openings adapted to pass over the teeth of sprocket wheels, the last-named links being provided with easily detachable means by which the sections are held together.

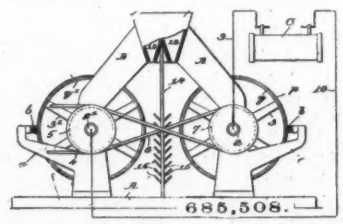
685,435. PROCESS OF DESULPHURETING AND SETTLING RAW SALT BRINE.—Frederick M. Ruschhaupt, Milwaukee, Wis. The process consists in conveying the brine for a long distance in a shallow trough, the trough having side walls from which evolved sulphureted gas heavier than the air may readily escape by flowing laterally from the surface of the brine substantially at a level with the surface of the brine, and then adding to the brine an aluminic sulphate and soda.

685,498, 685,499. BLAST FURNACE TOP.—Samuel W. Vaughen, Johnstown, Pa. The combination of a port-plate provided with a series of openings and intervening solid portions, a closed distributing chamber revolubly


685,498.

mounted thereon having a similar series of openings arranged to register with the openings in said port plate, and means for revolving said distrbuting chamber as desired.

685,508. METHOD OF SEPARATING VALUABLE METALS FROM METAL BEARING MATERIAL.—Clinton E. Dolbear, Hyde Park, Mass., assignor to American Mining and Metal Extraction Company, Portland, Me., and Boston, Mass. The method of separating commingled conductors and non-conductors of electricity, which consists in subjecting them thus commingled to the influence of an


685,508.

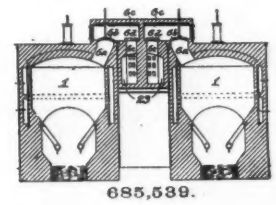
electrode highly charged with electricity, whereby, after contact therewith, the conductors are repelled from said electrode while the non-conductors remain under the attracting influence of said electrode, and separately collecting the thus separated materials.

685,451, 685,452. HIGH-SIDE GONDOLA CAR.—George I. King, Detroit, Mich., assignor to American Car and Foundry Company, St. Louis, Mo., a corporation of New Jersey. The combination with body bolsters, of a center sill, side walls which serve as webs of a plate girder structure, and a trussed structure carried by the side walls for supporting the center sill at a point intermediate the bolsters, said trussed structure comprising a compression member secured to the lower edges of the plate girders and to the upper edges of the center sill and a tension member secured to the lower edges of the plate girders and the lower edges of the center sill.

685,468. ROLLING MILL.—Joseph Fawell, Pittsburg, Pa., assignor to Mackintosh, Hemphill & Company, Pittsburg, Pa., a corporation of Pennsylvania. In a three-high mill, the combination of adjusting screws for shifting the upper roll, fluid pressure mechanism for balancing the upper roll arranged on the housing in line or approximately in line with the adjusting screws, fluid pressure mechanism for adjusting the middle roll, mechanism connecting such fluid pressure mechanism with the middle roll, and means for equalizing the movements of the ends of the middle roll.

685,515. CONVEYER.—Charles W. Hunt, West New Brighton, N. Y. The combination with the chain wheels, shafts or axles therefor and links pivotted upon said shafts or axles, of a carrying wheel having side flanges to support said chain wheels and to receive the links between them, and bucket supporting pins or rods secured in said links relatively near the ends thereof.

685,539. GAS FURNACE.—William Swindell, Allegheny, Pa. The combination of a gas-producing furnace having an air heating chamber formed in its walls, with a mixing chamber formed in its walls, with a mixing chamber, sep-


685,539.

arate but adjacent conduits leading from the furnace and air-heating chambers respectively to the mixing chamber, and a combustion chamber in the form of a revolving drum opening into said mixing chamber.

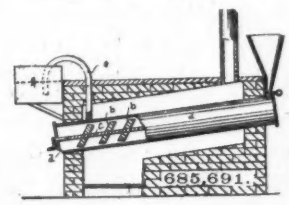
685,579, 685,580. CONVEYING APPARATUS.—James G. Delaney, New York, N. Y. In combination, two relatively moving supports, a rope-way between the same, a tension device on one of said supports tending to hold said rope-way taut and a rope extending from said tension device to the other of said supports whereby the operation of said tension device is controlled.

685,618. KILN.—James W. Le Gore, Le Gore, Md. A burning chamber, a passage-way located directly under said burning chamber, and a furnace on each side of said passage.

685,622. GUIDE FOR STAMP MILLS.—Edmund Major, Denver, Colo. The combination with the girth beam, of a bolt or tie-rod secured thereto, and a front and back clamping plate, the back clamping plate engaging the girth beam, the tie-rod having an enlarged or swaged portion intermediate its ends and engaging the back clamping plate and having its outer end arranged to be engaged with the front clamping plate.

685,641. APPARATUS FOR DRILLING AND OPERATING WELLS.—Joseph Reid, Oil City, Pa. The combination of a well drilling and operating apparatus, a continuously running explosive engine having a main drive shaft, a power-transmitting shaft, a coupling securing the transmitting shaft directly to the main shaft end to end, and a stopping, starting and reversing clutch.

685,691. ART OF EXTRACTING GOLD FROM REFRACTORY ORES.—Robert McKnight, New York, N. Y., assignor to Metallic Condenser Company, a corporation of Delaware. The art consists in pulverizing the ore, mixing with the pulverized ore a quantity of haloid salt or an alkaline metal, the relative proportions of the materials being


685,691.

substantially those quantitatively requisite to produce when heated in the presence of oxygen, a haloid salt of the precious metal, and an oxygen salt of the alkaline metal and the refractory metalloid, roasting the mixture with free access of air and agitation at a temperature sufficient to effect the reaction mentioned, but substantially shut off from the products of combustion, until the reactions above mentioned are accomplished, and volatilizing and recovering the precious metal values as haloids or oxyhaloids.

685,704. DEVICE FOR CONTROLLING THE USE OF COMPRESSED AIR.—Melville C. Wilkinson, Los Angeles, Cal. A combination of compressing cylinders, pipes and chambers so arranged as to regulate the pressure.

685,719. FUEL-SAVING COMPOUND.—Charles P. Harris, Rutland, Vt. A composition of matter consisting of water, coal dust, marble dust, chloride of sodium, soap ashes of wood, ashes of coke, ashes of tanbark, and sawdust.

PERSONAL.

Mr. Frank C. Earle is now general manager of the El Paso, Tex., Smelter.

Mr. James McCarthy has returned to Florence, Ariz., from a visit to New York City.

Mr. C. W. Kempton, mining engineer, has gone to Peru, S. A., on professional business.

Mr. C. A. Ross, of the Standard Copper Company, has been in Clifton, Ariz., from London.

Mr. P. L. Sizer, mining engineer, recently returned to Helena, Mont., from Chihuahua, Mex.

Mr. A. J. Bowie, who is now in Maila, P. I., is expected to return to San Francisco next March.

Mr. V. W. Miller has resigned as superintendent of the California-Ophir Mine, at Carson Hill, Cal.

Mr. E. S. Willard has resigned as general manager of the Hanging Rock Iron Company at Ironton, O.

Dr. George L. Loope, of Chicago, is in California, looking after mining interests in Tuolumne county.

Mr. John Grant, a well known mining man, of Central City, Colo., is making a business trip to the East.

Dr. C. E. Coolidge has succeeded Dr. D. S. Kimball as professor of machine design at Cornell University.

Mr. E. F. Lungren, of Aurora, Ill., succeeds Mr. Munn as master mechanic at the Old Dominion mines, Globe, Ariz.

Mr. L. B. Johnson has been appointed superintendent of the Gold Bank Mine at Forbestown, Butte County, Cal.

Messrs. F. Bolsinger, R. W. Lewis and I. D. W. Stevens, of Central City, Colo., have gone to Custer, Id., to operate a mill.

Mr. T. J. Driscoll, resident engineer of the United Coke and Gas Company, at Sydney, N. S., left Sydney recently for New York City.

Mr. T. Davis, of Tucson, Ariz., has been appointed superintendent of the Mammoth-Collins Gold Mining Company at Mammoth, Ariz.

Mr. Frank R. Reade, of San Francisco, has gone to Terlingua, Tex., to take charge of the Marfa & Mariposa quicksilver mines.

Mr. Waldemar Lindgren, of the United States Geological Survey, is making a reconnoissance of the copper deposits near Clifton, Ariz.

Mr. Garry B. Levan has been appointed superintendent of Laura Furnace, of the Republic Iron and Steel Company, at Youngstown, O.

Mr. J. H. Brown, superintendent of the Newbury Mining Company, returned to Florence, Ariz., recently from a trip to Boston, Mass.

Mr. J. J. Reilley of Central City, Colo., has returned after a 2 months' trip to New Mexico, Arizona and California mining camps.

Mr. M. M. Johnson, mining engineer on the staff of Mr. Samuel Newhouse returned to Salt Lake, Utah, November 3, from the East.

Mr. C. L. Dooley, who has been engaged for 18 months in mining operations in Siberia, has returned to his home at Michigan Bluffs, Cal.

Mr. O. K. Kennedy, of Ogden, Utah, has been in the Spring Mountain District in Lemhi County, Ida., to examine the Iron Crown group of claims.

Mr. R. B. Thomas, a mining operator of New Mexico, has been visiting Indianapolis, Ind. Mr. Thomas is interested in a smelter and mines near Los Cerrilios.

Senator W. A. Clark, of Montana, recently returned to New York City from an inspection of his mines. He has now gone to Europe for a short rest.

Mr. D. C. Lloyd, of the James Bridge Steel Works, Wednesbury, Eng., is now on a visit to the United States to inspect the principal American industrial plants.

Mr. S. W. Tyler, expert for the Grand Central Mine at Tintic, Utah, in its law suit with the Mammoth, arrived in Salt Lake, Utah, November 5, from Denver.

Mr. Richard A. Parker, consulting engineer of the United States Mining Company, has been in Salt Lake City, Utah from Boston. He inspected the company's new smelter.

Mr. Theodore K. Wilkinson, formerly superintendent of the Anaconda electrolytic plant, at Anaconda, Mont., is now in San Francsico, where he will probably locate permanently.

Mr. J. S. Jones, of Chicago, spent a couple of days last week at Oskaloosa and Coalfield, Ia., looking over the development of the Miller Creek Coal Company, of which he is president.

Mr. J. H. McKenzie, manager of the Grant Mariposa property in California, has, it is stated, succeeded Mr. Bernard McDonald as manager of the Le Roi Mine at Rossland, B. C.

Mr. Ernest R. Woakes, consulting engineer to the Duncan United Mines, Limited, of Nelson, B. C., is in New York City on his way to London. He expects to return to Nelson in January next.

Mr. E. F. Freudenthal, who with Mr. A. B. Lewis of New York City, bonded the Pioche Consolidated properties at Pioche, Nev., was in Salt Lake, Utah, last week returning to Pioche, November 8.

Mr. Robert E. Hanley, manager and part owner of the Niagara Mine, near French Gulch, Shasta county, Cal., has been appointed superintendent of the Shasta King Mine by the Trinity Copper Company.

Mr. James Cusick, late State mine inspector of South Dakota, has returned to Lead from Cape Nome, where he acted as superintendent of the Cape Nome Hydraulic Mining Company during the past season.

Mr. Harry Guess, a graduate of the Kingston, Ont., Mining School, who has been manager of the Sakoose Gold Mine, in the Rainy River District, has resigned to become the manager of a cyanide plant at Silverton, Colo.

Mr. James O'Donovan, formerly chief electrician of the Youngstown Sheet Iron and Tube Company Youngstown, O., has been appointed master mechanic of the bessemer plant of the Republic Iron and Steel Company.

Mr. L. W. de Grave has resigned his position as director and engineer of the firm of John Davis & Son, Limited, of Derby, Eng., makers of mining machinery and instruments, and has begun practice as a consulting engineer at Derby.

Mr. H. C. Adams, of Chicago, vice president of the Jones & Adams Company, was at Springfield, Ill., on November 8 visiting the company's mine at that place. Mr. J. W. Benjamin, fuel agent of the Chicago & Alton Railway, was with him.

Mr. Walter G. Filer, general manager of the Western Exploration Company at Salt Lake, Utah, accompanied by Mr. W. I. Rader, superintendent of the Annie Laurie Mine, is in Shasta County, Cal., to inspect the Balakalava copper property.

Mr. Solon J. Vlasto, of New York City, has returned from a 2 months' trip through Western mining districts. Among the prominent properties visited were those controlled by Senator Clark, in Arizona, Montana and California.

Prof. Charles E. Munroe, of the Columbian University, Washington, D. C., has been appointed by the Royal Academy of Science at Stockholm, Sweden, to nominate American inventors and discoverers in chemistry who desire to compete for the Nobel prizes.

Mr. W. R. Kirk, of Chicago, who is a large stockholder in the Majestic Copper Company's mines in Beaver County, Utah, visited the Taylor & Bennton Sampler to inspect a shipment of copper ore with Mr. A. B. Lewis, manager of the company, on November 4.

Mr. P. J. Donohue, of Salt Lake, Utah, general manager of the Sivirijoa Company's mines, has gone to the property in the State of Sinaloa, Mex. He was to be joined at Nogales by Mr. O. R. Nelson, president of the company. Mr. Donohue expects to be away a month.

Mr. Edward Hooper, who has been for some time a partner in the firm of Messrs. Bewick, Moreing & Company, mining engineers, of London, has severed his connection with that firm and started in practice as a consulting and mining engineer at Salisbury House, London, E. C.

Mr. Geo. W. Greenwell, manager of No. 2 colliery at Glace Bay, N. S., of the Dominion Coal Company, has been transferred to Dominion Nos. 3 and 4 collieries. He was presented with a gold watch by the employees. Mr. Greenwell is succeeded by Mr. Alexander McEachern at No. 2 colliery.

General Kaulbars, the commander of the Russian forces in Siberia and Manchuria, has returned to Russia via the United States. He states that great progress will be made in Manchuria in the next few years in the way of opening up the country, in which development Americans will take an active part.

Messrs. G. A. Richard, manager of the Mount Morgan Mining Company, at Mount Morgan, Queensland; H. P. Searle, engineer of the same corporation, and J. H. Carle, a prominent mining man from London, Eng., recently were guests of Manager Herron, of the Tomboy Gold Mines, at Telluride, Colo.

Mr. F. M. Keach, of the firm of Wm. G. Young & Co., the stock brokers of Los Angeles, Cal., was in New York last week on a business trip. He reports mining prospects in Arizona, New Mexico and Southern California as being unusually active, the interest shown being greater than for many years past.

Mr. Bert Dunn, of Houghton, Mich., a graduate of the Michigan College of Mines, has gone to Northern Mexico for a 2 years' trip at the head of a party of mining engineers, in the employ of a number of private individuals, and will go over a certain stretch of territory in search of gold, silver and other metals. Mr. Dunn is a son of Capt. William A. Dunn, of Houghton.

OBITUARY.

John L. Thorndike, an American engineer, was buried at Chorillos, Peru, on October 11. He went to Peru in 1868 with Henry Meigs, and co-operated with him in building the famous Oroya Railroad into the Andes, and in his other undertakings. At the time of his death Mr. Thorndike was the concessionaire from the Peruvian Government of the proposed extension of the Oroya Railroad from Oroya to Cerro de Pasco.

Arthur Burr Meeker, formerly a resident of Chicago, Ill., died at Utica, N. Y., on November 6, aged 66 years, leaving a widow, son and two daughters. He was born in Utica, N. Y., in 1835. After leaving Hamilton College, at the age of 18, he entered his father's hardware store. In 1856 he settled in Chicago, engaging in the iron and coal trade. The firm was originally Bellamy, Meeker & Company, later becoming A. B. Meeker & Company, then E. L. Hedstrom & Company, and afterward Meeker, Hedstrom & Company. As president of the Menominee Iron Company Mr. Meeker did much to enlarge the production of the Lake Superior iron mines and extend the sales of this iron among the Western trade. Mr. Meeker erected the first blast furnace in Chicago, in Bridgeport. He was the promoter and for a long time the president of the Joliet Iron and Steel Works, and up to 1875 was extensively interested in the iron business in St. Louis. The firm of A. B. Meeker & Company brought the first cargo of Scotch iron direct to Chicago from Glasgow in 1859. Mr. Meeker's health failed him in 1885, and he retired from active business.

SOCIETIES AND TECHNICAL SCHOOLS.

YALE UNIVERSITY.—The total registration this year is 2,680, an increase of 178 over last year. The Graduate School this year has 329 students, Yale College 1,236, and the Sheffield Scientific School 624.

THOMAS S. CLARKSON MEMORIAL SCHOOL OF TECHNOLOGY.—Prof. William S. Aldrich, late of the University of Illinois, has entered upon his duties as director of this school at Potsdam, N. Y. Prof. Edwin Haviland, Jr., will occupy the chair of civil engineering, and W. S. Graffan has been appointed superintendent of shops.

SYRACUSE UNIVERSITY.—C. B. Thwing is professor of physics, filling the vacancy caused by the resignation of Prof. Eugene Haanel. F. A. Saunders is instructor in physics; H. C. Cooper, instructor in chemistry and E. H. Kraus, instructor in mineralogy. George C. French, of Mexico, N. Y., has given $4,000 to Syracuse University toward founding a chair of mathematics as a memorial to his brother, the late Dean, John R. French.

ENGINEERS' CLUB OF ST. LOUIS.—At the meeting on November 6 there were 37 members and 6 visitors present. Mr. Kinealy, for the Executive Committee, made a report regarding securing downtown quarters. After considerable discussion a motion was made by Mr. Bryan, which was amended by Mr. Flad; the amended motion was carried. It was as follows: "That the recommendation of the Executive Committee in the matter of securing downtown quarters in association with the St. Louis Chapter of the American Institute of Architects and the St. Louis Architectural Club be approved, and, that the Executive Committee be authorized to arrange all necessary details." Messrs. Ben. F. Affleck and James C. Travilla were elected to membership. Owing to the unavoidable absence from the city of Mr. H. H. Humphrey, who was to have read a paper on "Uses of Beaumont Oil," Mr. Alex. S. Langsdorf kindly addressed the club on the subject of "Iron in Alternating Current Circuits." He discussed the curves of magnetization, loops due to hysteresis, and described a simple method of obtaining the co-efficient of self-induction. Discussion was participated in by Messrs. Kinealy, Klauder and Langsdorf.

ENGINEERS' CLUB OF PHILADELPHIA.—At the meeting on November 2, there were 91 members and visitors present. A topical discussion on "The Needs of Industrial Education in America" was opened by Prof. Edgar Marburg, whose paper was on "The Needs of Industrial Education With Reference to the Schools." He said: "Manual training schools are not trade schools, and consequently cannot be expected to fill this need." He described the industrial art schools and trade schools which have been established and largely maintained by private munificence. The author hoped that the day is not far distant when every community will establish, in addition to its high schools and manual training schools, other schools to provide for the needs of the prospective business man and artisan.

Mr. Samuel M. Vauclain followed with a paper on the "Needs of Industrial Education with Reference to the Machine Trade," especially for the education of apprentices. He recommended that there should be a well-defined and improved system of indenture pursued by the owners of all industries to meet the various grades of boys seeking places. He believed that

the money now spent by the various trade schools should be devoted to a thorough teaching of mathematics and mechanical drawing, and perhaps chemistry and mechanics, while the shops of this nation could be organized into mechanical training schools. He briefly described what is being done by the Baldwin Locomotive Works of Philadelphia.

Mr. John M. Shrigley treated the subject "With Reference to the Building Trades." He described the work done at the Williamson Trade School, instructing young men in mechanical drawing and the scientific principles underlying the various trades concerned in building construction. He pointed out the fact that young men should be properly developed, physically and mentally, with a fair general education, before entering upon such specialized instruction. The difficulty of holding pupils through an entire course, and also of inducing many employers to place a proper estimate on the value of trade school methods, were pointed out. The ideal pupil for a trade school would be a graduate of a manual training school. Following the presentation of the papers, a general discussion was participated in by Messrs. H. W. Spangler, L. W. Miller, J. W. Sims, John Birkinbine, Silas G. Comfort, L. F. Rondinella, S. M. Vauclain, and Walter L. Webb.

Messrs. J. M. Cox, F. Jaspersen, Archibald M. O'Brien, A. C. Vauclain and E. H. Wray were elected to active membership, and Marion deK. Smith to junior membership.

A meeting was held at the club on November 1, at which steps were taken to organize an American Society of Electro-Chemists. It is hoped that the growing number of experts in this field will enable such a society to start work early in 1902. The encouragement given at the meeting promises good results.

INDUSTRIAL NOTES.

The Gardner Governor Company, of Quincy, Ill., is about to make a large shipment of pumps, etc., to Australia.

The Ingersoll-Sergeant Drill Company, of Easton, Pa., is about to ship about 100 tons of air compressors to Batium for use in the Baku petroleum fields.

The Northern Engineering Works, of Detroit, Mich., has lately secured contracts calling for the shipment of electric cranes to Glasgow, Brussels and Copenhagen.

Wm. Yagle & Co., Limited, of Pittsburg, Pa., are to manufacture the Blake ore and stone crusher, formerly manufactured by the Robinson-Rea Manufacturing Company, of Pittsburg.

The Stirling Boiler Company has broken ground at Barberton, O., for additions that will almost double the capacity of its boiler plant in that place. The five new buildings will each be 150 by 65 ft.

Wilmarth & Norman Company, of Grand Rapids, Mich., has shipped a number of drill grinders to Bombay and Calcutta, India; Rangoon, Burmah; Singapore, Hong Kong and Shanghai, China, and Manila.

The American Gas Furnace Company, of Elizabeth, N. J., is about to ship 13 special gas blast furnaces for installation in the new Manchester plant of the British Westinghouse Electric and Manufacturing Company, Limited.

The Hoisting and Conveying Machine Company, of Chicago, Ill., has been incorporated with $20,000 capital to manufacture hoisting and conveying machinery. C. H. Notter, Charles Berghoefer and M. A. Notter are the incorporators.

The Atlas Pipe Wrench Company, of 121 Liberty street, New York City, and Flood Building, San Francisco, Cal., received a bronze medal at the Pan-American Exposition. This was the highest award made for an exhibit of pipe wrenches.

The Chicago House Wrecking Company, of Chicago, Ill., has, it is stated, received a contract from a large mining company in Central Mexico, for a complete mining outfit, comprising boilers, engines, hoisting machinery, rock drills and an air compressor.

It is stated that the Virginia-Carolina Chemical Company has obtained a controlling interest in the Southern Chemical Company of Raleigh, N. C. The Southern Chemical Company has a capital stock of $250,000, and its output has been very large ever since its establishment.

The J. D. Smith Foundry Supply Company, proprietor of the Cleveland Facing Mills, is erecting a large addition to its extensive plant at Cleveland, O. Warehouse capacity for machinery and supplies has been increased by leasing a 5-story building at Nos. 36, 38 and 40 South Water street.

The Arthur Fritsch Foundry and Machine Company, of St. Louis, Mo., is busy in both its foundry and machine departments. It is occupied chiefly with orders from mining companies for concentrating tables, jigs, pumps, classifiers, etc.; but is also building a number of slag pots for furnaces.

The De Lamar Copper Refining Works is making purchases for its plant at Carteret, N. J., through H. A. Prosser, manager of the company. The power plant is to be of 1,000 h. p. capacity. The engine order went to the Harrisburg Foundry and Machine Company, of Philadelphia, Pa. The boilers will be equipped with Roney stokers.

The projected plant of the National Portland Cement Company, Limited, of Toronto, Ont., is to be equipped electrically with about $60,000 worth of machinery manufactured by the Westinghouse Electric and Manufacturing Company, of Pittsburg, Pa. The John A. Mead Manufacturing Company, with offices in New York City, is to furnish apparatus for handling the hot clinker.

The Lane & Bodley Company, of Cincinnati, O., has secured an order for 2 large engines for the plant that is to be erected at Washington, Pa., by William Jessop & Sons, Limited, of Sheffield, England. The engines are to be of the Corliss type, one being of 28-in. by 72-in. stroke, and the other 24-in. by 60-in. The new plant of the Jessop company is to be started soon after April 1.

The Sturgess Governor Engineering Company, manufacturing governors for turbines and impulse water wheels at West Troy, N. Y., is equipping a machine shop, 100 by 50 ft., with modern machine tools. The equipment comprises boring mills, milling machines, lathes and other similar tools. The firm expects to duplicate this machine shop, and may also add a foundry and other shops. John Sturgess is vice-president and general manager.

The Athens Foundry and Machine Works, Athens, Ga., has been incorporated under the laws of Georgia with a capital stock of $15,000. John R. White is president, J. A. Norton general manager, and J. H. Houchin superintendent. The company has the plant of the old Athens foundry and machine works. The old machinery is being reconstructed, and new machines have been installed. The company will make power transmission machinery.

A bronze medal was awarded at the Pan-American Exposition to the Atlas Pipe Wrench Company, of 121 Liberty street, New York City, and Flood Building, San Francisco, Cal., for the Atlas tube cleaner for water tube boilers, which was the highest award made for tube cleaners for water tube boilers. The Atlas Pipe Wrench Company had on exhibition only 2 specialties, and for each one received the highest award—a bronze medal for Atlas pipe wrenches and a bronze medal for tube cleaners for water tube boilers.

The A. Leschen & Sons Rope Company, of St. Louis, Mo., states that it has moved its Chicago office from South Canal to 137 Lake street, where it will have a very large warehouse carrying a complete stock of wire rope, Manila rope, Sisal rope, packing waste, pulley blocks, sheaves, wire fittings and other supplies. The company manufactures the "Hercules" brand of wire rope, and also patent flattened strand wire rope and aerial wire rope tramways. The company now has branch offices in New York City and San Francisco.

The Lehigh Portland Cement Company has started work on its plant at Mitchell, Ind. The main building, 550 ft. long, 112 ft. wide and 35 ft. high, will be built of concrete and iron by the American Bridge Company. The entire plant will cover 21 acres of land, employing 350 men, and in operation both day and night, and will use 150 tons of coal daily. It will require 200 men 9 months to erect the buildings. The erection of the plant will involve an expenditure of $500,000, all buildings being fireproof. The daily capacity will be 2,200 bbls.

The Penberthy Injector Company, of Detroit, Mich., is installing a new 200-h. p. engine, to replace a smaller one heretofore in use, this increase in power plant being rendered necessary by the growth of its business during the past year. With the new engine and additional lathes and other machinery, which it has put in, it will have one of the best equipped plants in the country for turning out its line of goods. The company will soon place on the market a low water alarm, operating on a purely mechanical principle; also a positive force-feed lubricator.

TRADE CATALOGUES.

General Catalogue No. 26, published by the New York Blower Company, of Bucyrus, O., describes the exhausters, blowers, heaters, and engines the company manufactures, also the firm's mechanical draft and drying apparatus, dry kilns and appliances.

No. 29 of the "Record of Recent Construction" of the Baldwin Locomotive Works, of Philadelphia, Pa., is an interesting pamphlet of 45 pages, containing a reprint of an illustrated article on "The Building of a Modern Locomotive" that appeared in the *Brotherhood of Locomotive Firemen's Magazine.*

The E. D. Manufacturing Company, of Auburn, N. Y., issues circulars describing some of the special forgings it manufactures for electric motors, carriages, etc. The company states that it has excellent facilities for this class of work, and is prepared to name favorable prices promptly upon receipt of sample patterns or drawings to scale.

Tucker's combustion apparatus for determining with accuracy the volatile ingredients and total ash of any organic matter, is described in a little 12-page pamphlet published by Baker & Company, platinum refiners of Newark, N. J. The apparatus may be used for the dry distillation of substances. A number of important advantages are claimed for it, and the pamphlet should interest chemists.

The American School of Correspondence of Boston, Mass., issues a 74-page pamphlet describing its objects and the varied instruction it offers in its full engineering courses in electrical engineering, mechanical engineering, stationary engineering, marine engineering, locomotive engineering and heating, ventilating and plumbing. The school also offers special courses in mathematics, chemistry, and metallurgy, mechanical drafting, plumbing and gas fitting, etc. The school states that as it is located in Boston it is able to secure for instructors, graduates and teachers of the great technical schools for which that city is famous.

The Robins Conveying Belt Company, of New York City, has issued a new edition of its catalogue. This is a finely illustrated pamphlet of 72 pages, showing the construction of the company's well-known belt conveyors and also showing many of the purposes for which the conveyors are now used with success. For instance, these belts are in use handling zinc concentrates at the works of the New Jersey Zinc Company, at Franklin, N. J., for handling tailings from the Indiana gold dredge at Oroville, Cal.; for storing coal at many large power plants; for handling crushed stone and ore in mills, or for crushed slag at a Portland cement works; also as a sorting belt, permitting the grade of ore fed to the crushers to be improved with the smallest outlay for labor. The Robins belt conveyor has been used, moreover, in contracting work as a strong and serviceable device for expeditiously handling large quantities of dirt.

The Overstrom diagonal concentrating table is described in an attractive 24-page pamphlet issued by the makers, the American Engineering Works, of Chicago, Ill. This table is the invention of G. A. Overstrom, who has been employed in the concentrating plant of the Anaconda Copper Company, at Anaconda, Mont. The table is built diagonally to the reciprocating motion and to the flow of the wash water. The merits claimed for this construction are no vacant space on table, economy of floor space, no middlings or middlings elevator, long feed box, and economy of water. The outside dimensions of the table are 16 ft. 7 in. by 6 ft. Its shipping weight, boxed and crated, is about 2,200 lbs. The pamphlet shows the construction of the table very clearly, and by colored diagrams illustrates the difference in table action on perfectly sized material on retangular tables and on the Overstrom diagonal table.

GENERAL MINING NEWS.

ALASKA.

DOUGLAS ISLAND.

Alaska Mexican.—This mine reports for the month ending October 15, 16,505 tons ore crushed, realizing $19,820, and 240 tons sulpherets, valued at $6,960. The gross yield was $28,660, and the working expenses were $23,518. The ore averaged $1.74 per ton.

Alaska Treadwell.—The mine reports 74,938 tons of ore crushed for the month ending on October 15, valued at $86,891, and 1,230 tons sulpherets saved, valued at $70,080. The gross yield for the month was $166,459; working expenses $57,799; average of ore worked, $2.22. There were 540 stamps employed. This is the largest yield for any month in the history of the mine.

NOME DISTRICT.

Preparations have already begun at Nome to work some of the gravel deposits by hydraulic methods. It is stated that the first hydraulic outfit started cleaned up $53,000 as a result of 8 days' work.

(*From Our Special Correspondent.*)

The exodus from Nome for the Winter is large, and some 2,500 miners from that point arrived in Seattle, Wash., during the last week in October.

ARIZONA.

MOHAVE COUNTY.

(*From Our Special Correspondent.*)

Midnight.—This mine at Chloride, has been purchased by James Wilson for $50,000. Men are to be put on at once to develop the property and a mill is to be erected.

ARKANSAS.

MARION COUNTY.

(*From Our Special Correspondent.*)

Beulah.—A large engine for this mine is being transported to the mill and other improvements are under way.

Markle.—This mine has a new mill under construction and expects to be turning out ore within 30 days. A. J. Flynn is in charge.

CALIFORNIA.

AMADOR COUNTY.

(From Our Special Correspondent.)

Central Eureka.—The tailings plant at this mine at Sutter Creek, has been leased to E. Kuchenbacker, who formerly had charge of a similar plant at Amador below the Keystone for several years. He is now in charge.

Peerless.—At this mine 2 1-2 miles south of Jackson, a body of fair milling ore was found while drifting south on the 800 ft. level, about 100 ft. from the shaft. The ledge is about 2 ft. wide.

CALAVERAS COUNTY.

(From Our Special Correspondent.)

Emma.—This mine about 2 miles west of Valley Springs, owned by Brown, Reed & McSorley, has been bonded by the McSorley Brothers. The shaft is down 130 feet. The 17 ft. ledge prospects well. Grading is going on for a steam hoist which is on the way to the mine, and a 10-stamp mill is to be put in at once.

Fannie Marie Gold Mining Company.—This company has secured a bond on the Blue Jay and Summit Mines in the Jesus Maria district. The price, $6,000, is to be paid in monthly installments of $500 each. The company is already taking out ore for a mill test from the various openings along the lead. The mines have been well explored by cuts and shafts for over 2,000 feet. It is proposed to run a tunnel on the vein so that 800 feet of backs can be secured.

Gwin.—At this mine 4 miles southwest of Mokelumne Hill, stoping goes on constantly and 80 stamps are kept busy. The company is now putting in a new sheave at the hoist. Arrangements are being made to add 20 additional stamps at once, the buildings being ready.

Meloncs.—A large force of men is building the flume from the dam to the tunnel at Horse Shoe Bend about 1 mile distant. Work has already started on the waste weir tunnel which will conduct the waste water to the river from the 50 ft. wheel pit. W. C. Ralston is superintendent.

Nigger Hill.—This gravel mine near Campo Seco, has been secured by a local company which is preparing for active work. This surface was worked in early days by the hydraulic process. Later a large body of cement gravel was developed on the top of the hill which will pay good returns. This cement lies on a false bedrock underneath which is a large body of blue cement gravel. The present company will only work the upper cement gravel. A mill is to be erected and ample water for power can be secured from the Mokelumne Hill & Campo Seco canal.

EL DORADO COUNTY.

(From Our Special Correspondent.)

Josephine.—At this mine 1-2 mile east of Volcanoville, tunnel No. 5 is being driven 25 ft. per week. Two shifts are worked under the superintendency of J. M. Nougues, Jr.

Julia.—This mine in the Salmon Falls district near Pilot Hill, has been leased for 2 years to E. D. Ingraham, a Colorado miner, who is much pleased with the prospects.

Lukens & DuBois.—A small force is working this claim near Hog's Diggings between Cool and Pilot Hill. New machinery is being installed. William McCoy is superintendent.

INYO COUNTY.

(From Our Special Correspondent.)

Santa Paula Mining and Reduction Company.—This company's mill in the Argus Range, will be running in a few days. There are six men working at the mill, which is 4 miles distant from the mines, while 5 men are taking out ore at the mine. They have one vein running from 2 to 4 ft. in width, and another of lower grade 15 ft. wide.

Wild Rose.—This group of 4 antimony mines on the western slope of the Panamint Mountains, is being developed. The vein can be traced 4,500 ft. On the Monarch an open cut has been made 80 ft. long and about 20 ft. deep, showing the ledge to be 6 ft. wide. From the face of this cut a tunnel has been run 18 ft. About 250 ft. east of the cut another tunnel has been run showing 3 ft. of ore. Two other tunnels showing ore. All the ore is said to average 50 per cent antimony.

NEVADA COUNTY.

(From Our Special Correspondent.)

South Idaho.—A company has been organized to work this property, one mile east of Grass Valley, and will begin to develop it. The ledge which runs down the 155 ft. shaft is parallel to the old Idaho and the owners believe they will develop a good property. No work has been done on the property for 7 years. There are 2 claims. John E. Carter, who was foreman in the Idaho for 20 years, is in charge.

SAN DIEGO COUNTY.

(From Our Special Correspondent.)

California King Gold Mines.—This company composed of Senator J. P. Jones, Jacob Ridgway, J. M. Gossam, James B. Grant, Senator Pettegrew, Silas B. Duches, Ashley W. Conle, Stilson Hutchins, S. W. Dorsey and others, is operating mines 20 miles of Yuma, on the Colorado River. An immense body of low grade free milling ore is said to be in sight. The ore is mined by open cuts and can be worked by the cyanide process, the estimated cost of mining and milling being very low. It is claimed that a large amount of ore valued at from $3.50 to $5 per ton has been blocked out. It is reported that a 1,000-ton cyanide plant has been ordered.

SHASTA COUNTY.

(From Our Special Correspondent.)

The gravel beds of Clear Creek a few miles from where it empties into the Sacramento River are to be prospected for gold, with a Keystone driller, owned by Postlethwaite & Loughborough of San Francisco. Active work will begin at once. The land on which the driller will begin prospects well in gold and a large dredger may be installed in the near future.

Arbuckle Ledge.—This ledge 30 miles southwest from Redding, which has been lost for many years, is reported to have been found by 2 prospectors, and the claim is being opened up. A number of prospectors have gone in.

Donkey.—This mine in the North Cow Creek District, near the Afterthought Mine, is being pumped out preparatory to resuming work. The water is now down to the 280 ft. level. San Francisco parties have an option.

SISKIYOU COUNTY.

(From Our Special Correspondent.)

At the South Fork of Scott River, preparations are in progress for extensive mining during the coming season. Water is low in the stream now, so that the ditches are empty, and there is a scarcity of water for fluming. The new dredger is nearing completion and will be tested in raising and washing the bedrock gravel up to and above Callahans.

A large ditch is being constructed from McKinney Creek to the peach orchard at Buckeye Bar, Klamath River, work being rushed to be ready for the rainy season. The ground is to be worked by a new style of elevator and giants. The pipes, giants, elevator and apparatus, have arrived at the railroad depot and will be hauled to the river at once.

A mill is to be put up at the Myers Place on Yreka Flats west of Yreka. A boiler and engine is being put in and wood hauled. In a short time the mill will be crushing ore.

Cherry Hill.—At this property work goes on steadily and good progress is being made in the new tunnel where the air drills were recently installed and from present indications the ledge will be struck soon. The mill is crushing ore from the upper workings. Over 30 men are employed outside of the tunnel force. The ledge in the new wing tunnel No. 3 shows up strong, and of good width, and large bodies of ore have been opened up in stopes 2 and 3 in the middle tunnel.

TRINITY COUNTY.

(From Our Special Correspondent.)

A 20-ft. copper ledge on the east fork of the New River, is being prospected. There are 2 other copper ledges in the same neighborhood, the ore from one is said to average $32 in gold, silver and copper. The country is difficult of access owing to lack of good roads.

Hammer.—Work at this placer mine at the junction of the South Fork and the Trinity River, is being pushed. The ditches dug will give ample water for the coming season. The gravel lies in benches from 150 to 850 feet above the river. Twenty-two prospecting shafts and tunnels have been run, reported to show values from 10 c. to $13.50 in gold per yard.

Valencia.—This property of 8 claims on the East Fork of New River, will employ 4 men this winter sinking a shaft. In the spring the company intends to erect a small smelter. The ledge is 30 ft. wide carrying gold, silver and copper. The company has made 10 miles of trail. The company operating this property also owns gravel bars on New River and intends putting in a hydraulic plant to be ready in the spring.

TUOLUMNE COUNTY.

(From Our Special Correspondent.)

Gagnere.—This mine at Tuttletown, has a shaft several hundred feet deep, and a 20 stamp mill. Work has been retarded by litigation.

Golden Gate.—The machinery at this mine a mile southwest of Sonora, has been put in complete order during the close-down. Needed repairs have been made to the mill and furnace and new tubs put in the chlorination works. The canal has been cleaned out and everything is ready to resume as soon as the rains set in.

Soulsby.—Since the Pennsylvania shaft has been unwatered, operations are confined to a drift towards the old works, where good ore has already been encountered. A jack-pump handles the water. The ore bins are full and the mill will start up as soon as the water comes. W. Sharwod is superintendent.

South Carlotta.—A shaft is being sunk on this mine near Carters. A mill test of 40 tons of ore is to be made soon. The vein is 18-in. wide, showing free gold.

Street.—This mine 1-2 mile north of Tuttletown is working a full force. The shaft is 300 ft. deep. The vein is from 2 to 3 ft. wide, assaying $25 to $45 per ton. Grading is in progress for a new mill.

COLORADO.

BOULDER COUNTY.

Boulder County Mining Company.—McFarlane & Co., of Central City have taken a contract to build a 10-stamp-rapid-drop mill for this company, at Caribou. The mill is to have all modern improvements, and will be completed by January 1.

EAGLE COUNTY.

New Camp.—According to John H. Webb, a promising mining camp is being developed at State Ridge, not far from Wolcott. Both lode and quartz claims have been located. The ores carry gold, silver and copper. One Eastern company is sinking a shaft on a group of 23 claims.

FREMONT COUNTY.

Tremont Mines Company.—This company at Paclamur, a short distance west of Florence, has it is stated opened a wide lead carrying copper, silver, lead and zinc values at a depth of 200 ft.

GILPIN COUNTY.

(From Our Special Correspondent.)

Gilpin Ore Shippments.—During October the shipments of smelting and crude ores, tailings and concentrates from the Black Hawk depot were 350 cars or 6,469 tons, a big month's business.

Receipts of Machinery.—60 h. p. boiler for Gettysburg Mining and Milling Company, engine for Scandia Mine; gasoline engine for Bonanza tunnel; 80 h. p. boiler for Missouri Mine; 35 h. p. boiler for Ingalls Mine.

Bonanza.—Denver parties have taken a lease and bond on this property for $10,000 and are going to put up machinery.

Cumberland.—Dickson Brothers are moving the 10-stamp mill formerly at Alice to this property at Kankakee.

Kansas-Burroughs Gold Mining Company.—An average of 85 tons per day was maintained during October, most of which went to the mills. The Phoenix-Burroughs shaft is being sunk to 1,400 ft. Pat McCann, Central City, is in charge.

Mingo Mining Company.—A second-hand plant has been installed and a new shaft-house 24 by 48 ft. erected. The shaft is 200 ft. deep and the company will sink deeper. L. Drake, Central City, is in charge.

Missouri.—Denver parties who are interested have installed a 80 h. p. boiler, and are going to sink the 300 ft. shaft deeper.

GUNNISON COUNTY.

Goodhope.—This mine at Vulcan has been operated by Dr. Louis Weiss and brothers of Del Norte for several years. The property is equipped with good machinery and development progresses steadily. It is one of the few properties in Colorado that produces native tellurium. The company is stoping unusually rich gold ore from the 6th level, 600 ft. from the surface.

Pure Gold Mining and Milling Company.—This company, in the Gold Basin District, about 7 miles south of Gunnison, has an incline shaft down over 200 ft., showing a vein carrying gold and copper. New buildings have been erected, and other improvements have been made for a winter's work. Milton Smith, Michael Finnerty and Judge Thompson of Denver are the principal stockholders.

Vulcan.—The owners of this mine at Vulcan, an adjoining property, are making preparations to resume work. The shaft is down 500 ft., and at this depth has encountered the same ore found in the Goodhope. The shaft will be sunk 100 ft. deeper, and a level driven to cut the rich vein now showing in the Goodhope.

LAKE COUNTY—LEADVILLE.

(From Our Special Correspondent.)

Smelter Situation.—Arrangements are being made to increase the capacity of the Arkansas Valley plant enabling it to handle more of the low grade sulphide ores. Ground has been broken at Salida 60 miles from Leadville by the Ohio & Colorado Smelting Company for its independent plant. 300 men are to be put at work and the plant will be completed May 1. J. C. Kortz of Cleveland, Timothy Goodwin of Leadville, and other men connected with the New Monarch Gold Mining Company are behind the independent plant. It will have a capacity of 1,200

tons a day. The company's property at Leadville can ship 300 tons daily; the remainder will be secured from other Leadville mines.

A. Y. & Minnie.—Lesseees are shipping about 30 tons of crude ore daily and also concentrating 100 tons, the lead sulphide concentrate being shipped to Pueblo.

Big Six Mining Company.—The leasing company is opening a good ore body on this gold belt combination which this week paid a dividend of $5,000 on its 500,000 shares. Owing to legal difficulties no important work has been done until recently.

Butcher Boy.—Work has resumed in the upper levels of the new shaft and a drift is being run in mineralized contact. P. L. Kimberly is interested.

Canterbury Mining Company.—It is stated that a body of iron ore 4 to 7 ft. thick has been followed for 100 ft. The stuff nets something over $2 to the ton.

Diamond Gold Mining Company.—Philadelphia men are behind this gold belt enterprise and are now drifting at the bottom level for the Resurrection oxidized ore shoot.

Fryer Hill Mining and Development Company.—This company takes the place of the New Fryer Hill Company and has a capital of 400,000 shares at $1 each. It owns 14 1-2 acres of patented ground developed by 3 shafts and 100 feet of drifts. Large bodies of manganiferous ores are exposed. The company intends sinking the Buckeye shaft 100 ft.

Gloucester Group.—This includes the Gloucester, Horner, Oregon, Stromboli, Maud S and Confidence claims in the Horseshoe district and has been sold for $10,000 by J. T. Ritchie to C. B. Kountz of Denver, who will develop.

Greenback Mine Company.—The smelters have limited shipments to 40 tons a day. The company has large sulphide deposits at the 1100-ft. level and could easily ship 200 tons a day.

Hap Hazzard.—The new lessees headed by Thos. Ovens have put a fine plant of machinery on the ground. A rich vein of gold ore is being followed while low grade honey-combed quartz is being opened.

Jason.—This iron proposition on Poverty Flat which has been idle several years is being worked by lessees this week and will ship steadily from its manganese deposits.

Penn Mining Company.—50 tons a day is the output from 2 shafts and the grade is improving. Prospecting with the diamond drill for the sulphide contact continues.

President.—A lead of silver ore is opened that shows an assay of over 1 oz. in gold. A shipment has just been made.

Rialto Leasing Company.—This Denver Company states that arrangements are under way for resuming work on the deep shaft of the Pyrenees.

Sedalia.—The old shaft is down 1,000 ft. Another 100 ft. should enable it to develop sulphide bodies.

South Evans & Ball Mountain Mining ana Development Company.—Eastern people are backing this enterprise. The base of operations is the old Nevada tunnel which controls 80 acres of fine territory. A shaft has cut 7-ft. of oxidized ore. The property will ship by December.

SAN JUAN COUNTY.

(*From Our Special Correspondent.*)

Dry Gulch District.—The Galty Bay group of 7 claims, owned by Butler, et al., has been leased and bonded to R. W. Hollis, who is employing 8 men on development. Eight are busy on the Daniel Webster, owned by Sullivan & Wolcott, and operated under the management of Wm. Sullivan. The Tin Cup, B. S. Nichols owner, has been bonded to Salida parties for $10,000. The Hawkeye and Badger, with shipping ore, are operated by John Corow, as is also the Blizzard. The George, Mountain Quail, M. T., and Summit lodes, are being worked by John Gray with a small streak of pay ore in sight.

Highland Mary.—Two new Durkee air drills have been installed on the Montezuma and Lookout veins, near Silverton. The property is operated by the Gold Tunnel and Railway Company, capitalized for 2,000,000 shares. Plans are being drafted in Toledo, O., for a 100-ton mill which will be erected in the spring. John R. Wyatt of New York, is one of the principal stockholders.

Kendrick-Gelder Smelter.—The capacity is being increased from 150 tons every 24 hours, and a 100-ton briquetting machine is being installed. The product is a 50 per cent copper matte. Plans are under way for the erection of a 200-ton mill for making copper-iron concentrates.

Marcelli Tunnel.—This property is being developed by a New York-Silverton company, that has installed a compressor and drills. The tunnel is in 400 ft. and is to cut the contact between the line and quartzite. John Woods is resident manager.

Mystic.—John Rowland is driving a 700 ft. cross-cut on this Silverton property, and is in 400 ft. The tunnel is to cut one of the big veins of the district.

Natalie Mining and Milling Company.—A new 16-drill Riedler compressor, with a battery of three boilers, has been installed, together with an engine and complete electric plant. The big Hurley tunnel, to open all the company veins is in 1,000 ft. with 3,000 ft. to go. Three large veins have already been tapped, on which drifts are being driven. Rumors are afloat of a consolidation of the Natalie and Occidental companies under one management and operating the properties from the Natalie power plants.

Queen City.—W. W. Parshall has secured a lease and bond on this property in Ohio gulch and has a large force at work.

Stony Pass Group.—An 8 in. streak of petzite silver ore was encountered recently in a claim on Galena Mountain, which runs very high in gold. Preparations are being made for development during the winter.

SUMMIT COUNTY.

Eagle.—This mine, near Kokomo, belonging to Peter Breene, is shipping 60 tons a day of sulphide ores. The mine is opened by an incline shaft down 200 feet vertically. A tramway connects the mine and the shipping bins one-half mile distant on the railroad.

Mecca.—At these placers, on French Gulch, near Breckenridge, a new pipe line, 24 in. diameter was put in this season, and Evans hydraulic elevators have been installed.

Summit Mining Company.—This company is working the Summit Mine and Wilfley Mill, in charge of E. E. Byron, of Kokomo. It produces a sulphide ore, having silver, lead and gold values. The company has also the Excelsior Mill at Frisco, which belongs to Ault & Wiborg, and will send part of its ore there.

(*From Our Special Correspondent.*)

New Robinson Consolidated Mining and Smelting Company.—This company recently organized, with headquarters in Boston, owns at Robinson a large number of perperties, notably the old Robinson tunnel and the Washington, both once heavy producers of high and low grade ores. These properties are being prepared for heavy shipments at an early date. The ore is of a pyritic nature, carrying gold and copper. The old Robinson mill is being converted into a pyritic plant of 600 tons daily capacity of the Loder type. Three furnaces are being erected, connected by a 300-ft. dust chamber with a stack 150 ft. high. The company has many valuable properties belonging to Major Jesse McDonald, of Leadville, among its possessions, and is trying to have the first stack in operation by January 1. Frank Buckley, of Denver, was recently appointed manager, vice J. Duvall, resigned.

TELLER COUNTY—CRIPPLE CREEK.

(*From Our Special Correspondent.*)

Acacia Gold Mining Company.—A lease on the Morning Star claim has been purchased by R. P. Russell and associates, from the Bankers Leasing Company, of Pittsburg. The shaft is down 425 ft. Tom Bradford has been reinstated as manager.

Blue Bell Mining, Milling and Prospecting Company.—The property was recently transferred to a Wyoming corporation, to be organized with a capital stock of 1,000,000 shares, par value 10c. each. The company has no debts and has $1,140 cash and 172,610 shares of treasury stock.

Elkton Consolidated Gold Mining Company.—A lease has been granted on the Elkton dump to Lyon Strickland, of Colorado Springs. The lessees are to remove all the waste rock from the company's ground and may lease the Arequa Mill, now idle, to treat the best of the dump.

Golden Cycle Mining Company.—C. L. Hill, secretary of this company, says that ore is encountered in a cross-cut on the 9th level 700 ft. below the surface. The level has been practically not explored at all.

Last Dollar.—Owing to a large flow of water the lowest level has been abandoned for the present and a number of the miners laid off. Sinking will go on as soon as the water is under control.

GEORGIA.

LUMPKIN COUNTY.

Gordon.—This property, near Dahlonega, has been leased by Henry Roberts and W. W. Murray. They are working on the vein, and have made arrangements to put up a 5-stamp mill.

Lot 810.—At this mine, near Dahlonega, which is operated by J. M. Hutchings, work is progressing well, and the new mill of 15 stamps was recently started up.

ILLINOIS.

KNOX COUNTY.

Etherly Coal Company.—A. J. Cline, of Galesburg, is president of this company, opening new mines at Etherly.

PERRY COUNTY.

Egyptian.—This coal mine, at Duquoin, was recently leased to the Welles Coal Company. It is now in operation, and will give employment to a number of men.

RANDOLPH COUNTY.

Illinois Fuel and Power Company.—This company is preparing to sink a new coal shaft east of its mines. Work has started.

VERMILLION COUNTY.

(*From Our Special Correspondent.*)

Kellyville Coal Company.—This company is completing its big shaft at Westville, and expects to have it in operation by December 25. This will be one of the largest plants in the state, and the largest in the county, and may produce from 1,500 to 1,800 tons daily. It will be known as Kellyville Shaft No. 4, Michael Kelly, Danville, Ill., is president.

IDAHO.

IDAHO COUNTY.

(*From Our Special Correspondent.*)

Almance.—This mill, at Elk City, is running steadily. About 25 men are busy at the mine and mill. N. J. Coleman, of California, is manager.

Columbia Gold-Bug Mining Company.—This company has been incorporated at Lewiston. John E. Glover, of New Richmond, Wis., is president, and C. W. Colby, of Lewiston is secretary. A 40-h. p. boiler and hoist is being hauled to the mine, and a contract has been let to Dan. Trullinger to complete 450 ft. of shafts and crosscuts this winter. The property lies on the head of Big Creek, 24 miles southeast of Elk City, and is 76 miles from the terminus of the Northern Pacific Railway, at Stites.

Dewey Consolidated Mining and Smelting Company.—This company, with mines 7 miles east of Grangeville, is installing a gasoline hoist, and will sink 400 ft. The Dewey has shipped about $12,000 worth of high-grade ore to the Tacoma Smelter at a freight cost of about $30 per ton.

Dixie Queen.—The 10-stamp mill at Dixie is about ready to start.

Grangeville.—A recent test of ore from this group at Elk City, made in the Cleveland Mill, showed $19 per ton on the plates, and concentrates saved had a value of $520 per ton.

Midas Gold Mining Company.—Work on the 10-stamp mill is being pushed under the direction of A. C. McLean, manager. Campbell & Finch, of Spokane, are the principal owners. The Ajax is the best developed claim in Clearwater District, and has a large body of ore blocked out.

Thunder Mountain District.—One hundred and thirty pack animals are on the trail between Bear Valley and the Golden Reef Mine, packing machinery and supplies. The district is in the extreme southeastern portion of the county, and the packing distance from the nearest road is 60 miles. It is 160 miles from a railroad. The Golden Reef and adjoining properties, comprising 6 quartz claims and 3 placer claims, were purchased by Col. W. H. Dewey about a year ago. A company was organized in Pittsburg, Pa., with a capital stock of $5,000,000, to work the properties, and development has been continuous. A saw mill is in operation, and Superintendent Reed says that the 10-stamp mill will be in operation this winter. The formation is eruptive, and the country rock is rhyolite. A recent strike showed 6 ft. of high-grade gold ore. The Caswell Brothers, who were the former owners, have worked the property several years as a placer, the surface ore being free, gold occurring in cleavage planes. A company has been organized in Boise, with a capital of $50,000, to construct a road into the camp next spring, and maintain a stage line. The camp is now snowed up, and will be until next June.

OWYHEE COUNTY.

The South Oro Find (or Golden Chariot), Summit (or Minnesota), and South Chariot claims on War Eagle Mountain are now in litigation. Several men claim titles to various parts of the ground and the litigation is likely to last some time. New locations have been made on top of old ones.

SHOSHONE COUNTY.

Missoula Copper Mining Company.—This company will have its principal place of business at Wallace, and its capital stock of $100,000 is divided into 1,000,000 shares. The incorporators and directors are R. R. McCormick, John McLeod, Henry Billberg, J. N. Thennis and W. D. Greenough of Mullan, and J. M. Dixon and James D. Corbett of Missoula. It is organized to develop a group of 6 claims on the copper belt between the Snow Storm and the Copper King.

INDIANA.

PARKE COUNTY.

Minshall Vein Coal and Mining Company.—The directors of this company are W. W. Ray, Marshall G. Lee and William L. Williamson. The capital of the company is $50,000. The company will operate mines in this county and will have offices at Terre Haute.

IOWA.

WAPELLO COUNTY.

Bear Creek Fuel Company.—This company with capital stock of $20,000, has organized at Eldon by electing the following officers: President, Dr. D. A. Jey; vice-president, Dr. S. H. Smyers; treasurer, J. W. Allen, and secretary and general manager, David J. Lloyd. The Bear Creek Mine, just west of Ottumwa, has been purchased, together with a large acreage of coal land. The vein is said to be about 57 in. thick.

MARYLAND.

ALLEGANY COUNTY.

Frostburg Coal Mining Company.—J. W. Galloway and Edward R. Clayton, who recently purchased the Fairview coal property in Somerset County, Pa., have acquired control of the plant of this company at Barton, and will improve it. Messrs. Galloway & Clayton have headquarters in Baltimore.

MICHIGAN.

IRON-MARQUETTE RANGE.

Escanaba River, Land and Iron Company.—G. R. Thompson, manager of the Schlesinger property on the Gogelic Range, has been granted an option on the company's property, near Princeton, and may reopen the Nancy Hanks Mine, which was worked 12 years ago. The officers of the company are: Chas. Johnson, president, and Walter L. Maas, secretary-treasurer. The new board of directors consists of Charles Johnson, Walter L. Maas, Mrs. S. P. Kline, John F. Mack, Mrs. F. Lobb, Joseph F. Winter and Dr. O. D. Jones, the latter of Marquette.

IRON—MENOMINEE RANGE.

Chapin.—The improvements at this great mine in Iron Mountain include the erection of 2 new pumping plants at Chapin B shaft, the sinking of a shaft near the Chicago, Milwaukee & St. Paul tracks, a new Worthington pump at No. 2 Hamilton shaft, and the re-erection of the big Allis pump, formerly stationed at D Chapin shaft. A steel pumping station is also to be built on the 16th level of No. 2 Hamilton shaft.

The new pumping plants now being installed at B Chapin shaft are made by the Fred M. Prescott Steam Pump Company, and are triple expansions. One will be erected on the 8th level and the second on the 11th level. The one on the 11th level will have 10 and 15 1-2 and 26 by 8 1-2 and 24 inch cylinders, with a capacity of 700 gallons per minute against a 400 ft. head. The 8th level plant will be 15 and 23 and 39 by 11 by 24 cylinders, with a capacity for 1,200 gallons per minute against a 600 ft. head. The Worthington pump to be located on the bottom, or 16th, level of No. 2 Hamilton shaft is a compound condensing plant having a capacity of 750 gallons per minute against a head of 750 ft. This is supplementary to the large Prescott pump on the 12th level, which has a capacity of 1,000 gallons per minute against a head of 965 ft. The big Riedler pump, erected a few years ago by Fraser & Chalmers, of Chicago, is also located on the bottom level, at a depth of 1,330 ft. The pump is 6 7-8 by 9 5-8 by 30 in., driven by a 32 by 36 by 30 in. tandem Corliss compound engine. Its normal capacity is 1,800 gallons per minute against a head of 1,700 ft., but it has a guaranteed capacity against the same head of 2,200 gallons at 65 revolutions per minute. The pumping station on the bottom level is 60 ft. long, 35 ft. wide and 22 ft. 6 in. high, and is cut in the limestone, and to guard against a possible cave-in, the roof and sides are to have a steel lining. The work of erection will soon begin. Steel beams form the framework of the sides and curved eye-beams the upper part. The space between the steel work and the rock of the shaft will be filled in with concrete, corrugated iron taking the place of lagging. The most important work contemplated is the sinking of a large shaft near the Chicago, Milwaukee & St. Paul tracks. The ground is being tested with diamond drills, and sinking will likely commence early next year. At this new shaft it is intended to re-erect the Allis steeple compound Cornish pump, which was in service for a number of years at D Chapin shaft, and was dismantled in the summer of 1899. The property has been employing 1,000 men during the summer. Mr. Davidson is superintendent.

MISSOURI.

DOUGLAS COUNTY.

(From Our Special Correspondent.)

A fine grade of jack has been found upon the farm of Thomas Ross in the southern part of this county. The ore was first struck at a depth of only 8 ft.

JASPER COUNTY.

(From Our Special Correspondent.)

Joplin Ore Market.—The zinc market has advanced, and a large amount of zinc ore was sold at $1 per ton advance over the preceding week. The producers at Aurora, Mo., one of the largest camps of the district held out for as must as the producers in and around Joplin received, and none of the Aurora product was sold. Most of the agents went to Oronogo, where the prices were advanced from 50c. to $1 per ton.

The Lanyon Zinc Company, one of the largest purchasers, advanced the price on four large lots of ore and quite a flurry resulted. The top price paid for zinc ore in the district was $26.50 per ton for 60 per cent. This price brought the actual settlement up to $30 per ton. The low grade ore ranked exceptionally well.

Lead ore brought $23.25 per 1,000 lbs. delivered, the price paid for the past 10 weeks.

During the corresponding week of last year zinc ore's top price was $28.50 per ton, in the bin and lead ore brought $23 per 1,000 lbs. During that week the sales were less than last week by 1,050,240 lbs. of zinc ore and 539,200 lbs. of lead ore with a valuation $34,412 less.

The outlook for zinc ore producers is exceedingly bright and the industry has become very active. The district has been favored with very fine fall weather and the production has been very large. Following is the turn-in by camps for the week ending November 10:

	Zinc lbs.	Leads lbs.	Value.
Joplin	2,586,640	588,080	$49,886
Galena-Empire	1,452,460	232,460	22,835
Carterville	1,742,630	459,530	33,338
Oronogo	661,450	35,370	9,340
Webb City	465,650	14,790	6,397
Duenweg	188,220	86,830	4,560
Spurgeon	152,210	90,710	4,304
Badger	146,930	99,820	4,207
Carthage	528,340	....	7,397
Neck City	213,000	....	2,983
Granby	293,000	41,000	3,365
Carl Junction	280,610	....	3,929
Roaring Springs	171,420	2,930	2,037
Cave Springs	183,590	26,080	2,993
Zincite	176,280	11,100	2,635
Sherwood	196,320	....	2,748
Stotts City	139,980	....	1,960
Wentworth	84,000	....	1,176
Central City	66,720	3,510	883
Total	9,725,500	1,698,210	$166,973
Total 45 weeks	425,103,950	51,070,810	$7,081,411

Zinc value for week, $127,483; lead, $39,490; zinc value 45 weeks, $5,885,592; lead, $1,275,812.

GREEN COUNTY.

(From Our Special Correspondent.)

Ash Grove Land and Mining Company.—A pipe line has been completed to the mill owned by this company. The water is taken from the Sac River and enables the mill to handle 100 tons per day. A force of 20 men is in the ground and the developments are said to show a large body of lead and zinc ores.

MACON COUNTY.

Watson Coal Company.—The Kansas & Texas Coal Company has bought the coal property and old mine of this company, of Bevier City.

NEWTON COUNTY.

(From Our Special Correspondent.)

Sale of Zinc Land.—The White Oak lease and fee of 160 acres has been formally turned over to the purchasers. The price is reported as $110,000. This land was valued at $7 per acre 4 years ago. The purchasers are New York and English men. The late E. W. Carleton, who was correspondent of the ENGINEERING AND MINING JOURNAL, had an interest in the land.

TANEY COUNTY.

(From Our Special Correspondent.)

Zinc Ore Discovery.—A new strike near Long Creek was made recently of two leads about 15 ft. apart. The leads have been traced some distance and carry a large percentage of zinc carbonate.

MONTANA.

Coal Mining.—State Coal Mine Inspector Howard F. Welch states that the coal mining industry of this State in a most flourishing condition, and that the mines have been remarkably free from accidents during the past year. There are 10 coal mines in the State. Nine are located in 3 distinct fields and the other one is at Horr. There are 3 mines in Carbon County, one at Red Lodge, one at Gebo and one at Bridger, and these mines are worked to full capacity. The 3 mines near Great Falls are at Stockett, Belt and Sand Coulee, while there are 3 near Bozeman, the Chestnut, Mountain Side, and Trail Creek properties. All these mines are in excellent shape. None of the coal mined is shipped out of the State, and there is scarcely enough mined to supply the local market. The companies have fully complied with the law regulating the various safety appliances to be used.

FERGUS COUNTY.

(From Our Special Correspondent.)

Kendall.—About 100 men are now busy at the mine, besides the large crews working on the ditch at the new power plant on Warm Spring Creek. The old mill has been torn down and grading is under way for the new 100-ton cyanide plant. The ditch of the pipe line from Warm Spring is practically completed. Some of the pipe being used is iron, while a large portion is wood, wound with galvanized wire and tarred. The 3-wire line for the transmission of power has been completed. Every building will be heated by steam and lighted with electricity. Five hundred horse-power will be developed at the power plant, and the machinery at the mill and mine will be driven by individual motors. Superintendent Lang is in charge.

New Year.—The 100-ton cyanide mill at Maiden will start up again soon, when the bucket tramway connecting D tunnel with the mill will be completed. Three hundred feet raises are being put through this tunnel, so as to take out the ore in the old workings above.

Spotted Horse.—This mine at Maiden is doing active development and taking out high-grade sylvanite ore for shipment. The 20-stamp mill closed November 1 for the winter. A small hoist run by compressed air is installed at a winze on the 7th level to sink 200 ft., and the sinking will soon start in the main shaft. A new air compressor is to be put in, and drifting will begin on the 8th and 9th levels from both the shaft and the winze. C. T. Durell, the superintendent, states that the ore has become so base that it will have to be roasted before it can be treated at the mine. The cyanide mill is still treating the old tailings dumps.

Uris.—This North Moccasin cyanide property is reported bonded for $16,000 to Frank Flanagan, of Kendall. The property is ½ mile north of the Kendall Mine and the bond will run for 18 months. G. B. Stuart and D. J. Burr own the property.

Whiskey Gulch Cyanide Plant.—During October, 4,200 tons were treated, making a clean-up of $2,200. The gold slimes from the cyanide have to be retorted on account of the mercury carried in the ore.

LEWIS AND CLARKE COUNTY.

Canyon Gold and Copper Mining Company.—A strike of 2 ft. of good copper ore is reported on this company's property across the Missouri River from Canyon Ferry, 20 miles northeast of Helena. The strike is at 425 ft. in the tunnel, at a depth of 180 ft.

Winscott.—John A. Rowan has taken up the option on this property 4½ miles south of Helena, which he has held for 2 years. The ore is low grade but can be mined very cheaply; is now taken from an open quarry where 1 man in 10 hours can break down enough to supply the 15 stamp mill.

MADISON COUNTY.

Noble Mining and Milling Company.—This company operating at Nobleville, has a tract of 5 acres, 2 water rights, a 10-stamp mill, run by steam power. The lower tunnel of 2,000 ft. strikes the lead and going 155 ft. beyond taps the lead 1,400 ft. on incline. The main tunnel upraise starts 1,730 ft. from mouth of tunnel, raises 96 ft. and strikes vein; follows the vein up 400 ft., and will be continued to connect with upper workings. There is a 125-ft. shaft where the main tunnel cuts the vein. The principal ore is gold, with, it is said, 10 per cent of copper and some silver. A 2-compartment shaft may be sunk in in the near future. The property has been worked more or less for 35 years. A concentrator is in contemplation. D. A. Noble is foreman.

POWELL COUNTY.

Snowshoe Copper Mining Company.—This company has let a contract for 300 ft. of tunnel on the MacDonald group of 4 claims and a fraction on Snowshoe Gulch, near Elliston.

SILVER BOW COUNTY.

Boston & Montana.—At the Leonard Mine, at Butte, a pump with a capacity of 1,000 gal. per minute is being installed on the 1,200 ft. level.

Ticon.—James A. Murray has a force busy at this mine in Butte, under Perrie Delmas, foreman. The present shaft is 400 ft. deep. An upraise is being made from the 400 ft. to surface as another shaft.

NEVADA.

WHITE PINE COUNTY.

McKinley Mining and Smelting Company.—Concerning the notices of this company in our issue of November 9, Mr. Dix W. Smith, secretary of the company, writes: "This notice does us an injustice, as it is stated therein that the claims were slightly prospected. There has been $130,000 spent in the development of these claims and one of them—the Aultman—was worked for 7 years on a lease, and a large amount of gold taken therefrom."

NEW MEXICO.

COLFAX COUNTY.

Bobtail.—The Smithfield Company of Pittsburg, Pa., recently put in an 80 h. p. boiler for its hoisting works at this mine near Elizabethtown.

Legal Tender.—Two shifts are working on the tunnel at Elizabethtown. The tunnel is being driven to intercept the shaft and when completed, heavy hoisting machinery will be put in.

GRANT COUNTY.

(From Our Special Correspondent.)

Granite Cap Copper Company.—This company has been organized by Los Angeles men with a capital of $1,000,000. J. DeBarth Shorb, is president; Dr. I. B. Hamilton, vice-president; J. E. Hannon, secretary and treasurer, and W. E. Robinson, general manager. The properties consist of 9 copper claims

located about 13 miles from Stein's Pass, near the Mexican line. The ore recently developed is said to be rich. Several hundred tons are reported on the dump.

Mountain Key Gold Mining Company.—The incorporators and directors are Orlando B. Hardy, of Silver City, and Emmon S. Ovratt and John C. Frank, of Akron, O. The capital is $250,000, divided into 10,000 shares. The offices will be at Silver City and at Akron. It will work the Mountain Key Mine at Pinos Altos.

SOCORRO COUNTY.

Confidence.—The large fly-wheel for the new engine at the mill at Graham is being hauled in from Silver City.

Mogollon Gold and Copper Company.—This company has been incorporated to work the Little Charlie group of mines in the Mogollon district. Of the claims, the Little Charlie, Combination and Little Giant are said to be on the extension of the Little Fannie vein. Development work is reported to show gold and silver as well as a good per cent of copper. Shipments of ore have been made to the Silver City reduction works. The Malachite, Little Johnnie, Nancy Hanks, Selma, Iron Hat and Little Katie all belong to the same group.

NORTH CAROLINA.

ROWAN COUNTY.

(*From Our Special Correspondent.*)

Gold Knob.—These mines are under option to J. Yost, of Staunton, Va., who is doing systematic prospecting with a view to purchase.

MECKLENBURG COUNTY.

(*From Our Special Correspondent.*)

Cappe.—This gold mine, some 5 miles from Charlotte, is being opened by J. L. Villalonga and T. B. Gautier, of that city. A test run of 50 tons, made some time ago, gave $27 per ton in gold. The ore is iron pyrite, with some chalcopyrite.

SWAIN COUNTY.

The case of W. S. Adams, of Boston, against the Westfeldt heirs was recently decided against the plaintiff by the Superior Court at Bryson City. Mr. Adams, however, has taken an appeal to the Supreme Court at Raleigh, and the appeal has been allowed. The suit involves the title to a copper property.

OHIO.

BELMONT COUNTY.

Gaylord Coal Company.—This company is building a steel and iron tipple at its mines at Martin's Ferry. This will enable shipments to be made by the Wheeling & Lake Erie and the Cleveland & Pittsburg railroads. It is rumored that the company may extend its tipple to the river, and open a harbor for shipping by water.

OREGON.

BAKER COUNTY.

Columbia Gold Mining Company.—Recent consignments of machinery received at Sumpter include sawmill appliances, an engine, boiler and smokestack.

Flagstaff.—The new owners of this mine near Baker City have ordered a battery of 10-stamps, doubling the present capacity of their mill. Work at the mine is progressing rapidly.

Single Standard Gold Mining & Milling Company.—This company, with $250,000 capitalization in 25c. shares, recently purchased the Whitaker group of 5 claims on the Cornucopia road, 43 miles northeast of Baker City. The price paid is reported as $20,000. The property has been developed by over 1,000 ft. of tunnel and shaft work, showing a vein 18 in. to 4 ft. wide. The property is stated to have produced $56,000 with an arrastra. The company has acquired water rights and intends to install a mill and concentrating plant using electric power. It is said that the machinery has been ordered. The purchasers are Colorado men. The president is Capt. E. Storer Tice, of Denver, who is also general manager; vice president, Frank L. Whitaker, one of the original owners of the property; secretary and treasurer, Max Baroch, of Denver, who was instrumental in the sale of the property.

JACKSON COUNTY.

Golden Standard.—Many improvements are contemplated on this mine on Galls Creek, recently purchased from the Kublis by a Seattle syndicate that has already erected a number of houses and other buildings.

Rock Bower.—This placer property of 8 claims, covering about 200 acres of ground on Ward Creek, 14 miles east of Grant's Pass has been sold. The purchaser is J. H. Bagley, a mining man, of Marshall County, Ia., who has also secured options on other placer properties in the vicinity, besides water rights. Men are about to install 2 hydraulic giants and a complete modern plant.

JOSEPHINE COUNTY.

Baby.—At this mine, a short distance north of Grant's Pass, on Jump-off-Joe Creek, a 2-ft. vein was uncovered recently, which is reported to carry high values in free-milling gold. The mine was bonded recently by Meyers, Rice & Smith, of Pollock. Formerly the mine was operated only by an arrastra. The people now in charge ran a second tunnel below the old one, and exposed the ore. A third tunnel will be run.

Dry Diggings.—This property, 3 miles from Grant's Pass, owned by the Dry Diggings Mining Company, of which H. A. Corliss was president and principal owner, was recently sold for about $20,000 to men represented by C. W. Ament, of Chicago, Ill. The ground comprises 600 acres. It has been worked since the early 60's. During the past 8 years about 3 men have been employed each season, the length of the piping season varying from 10 to 60 days. The new owners will put in a pumping plant at Rogue River, ¼ mile distant, and with a reservoir will be able to run the year through.

Lyttle.—The sale of this copper property at Waldo was consummated recently by Capt. T. Waiu Morgan Draper. A large force of men will be put to work at once. This property was owned by James Lyttle, and has about 325 ft. of tunnels; the edge is said to be 22 ft. wide. Capt. Draper, general manager, is interested in 5 groups in the Waldo District.

PENNSYLVANIA.

ANTHRACITE COAL.

Girard Trust Company.—This company and the Summit Branch Coal Company have transferred to John C. Wilson, of Philadelphia, the line of the Summit Branch Railroad Company in Schuylkill and Dauphin counties, the railroad equipment and certain coal tracts. The consideration is $700,000.

Lehigh Coal and Navigation Company.—This company issued orders last week prohibiting its men from working in the lower lift of No. 12 Mine at Tamaqua. An immense body of water in the old Greenwood workings, adjoining, may break through.

Lehigh Valley Coal Company.—This company makes the following statement for September and the 10 months of its fiscal year, from December 1 to September 30:

	September.	10 months.
Earnings	$1,078,357	$17,503,680
Expenses	1,069,302	17,992,132
Net loss	$90,951	$488,452

For the 10 months there was an increase of $1,686,631 in earnings; an increase of $1,456,631 in expenses, and a resulting decrease of $230,000 in the net loss. Taxes are included in expenses. This company is improving the old Mineral Spring breaker. A heavy stone wall 1,200 ft. long has been built. A new engine house and boiler room are under way, the foundations of which are almost completed. Also a new shaft is being sunk at the foot of the old plane to reach the red ash seam. A new breaker will be built in the near future.

New Boston.—This colliery at Mahanoy City, destroyed some years ago by fire, will soon be rebuilt by the owners, the C. M. Dodson Coal Company. The new plant will be larger and employ several hundred men and boys.

Pennsylvania Coal Company.—This company is contemplating several changes and improvements at its No. 10 workings near Pittston. The company has shut down No. 10, jr., shaft for an indefinite period. The miners and laborers were transferred to No. 10 shaft. The company intends sinking the old shaft to the red ash vein, from where the coal will be transferred from the abandoned one. It is thought the coal will be handled in a similar way from No. 9 shaft, thereby lessening expenses

BITUMINOUS COAL.

Clyde Coal Company.—This Pittsburg company has started operations at Fredericktown, in the Monongahela Valley, where it will soon produce 3,000 tons daily. The plant is equipped with modern mining apparatus and electric machinery, by the Jefferson Manufacturing Company, Columbus, O. A double steel tipple was supplied by the American Bridge Company and the Phillips Mine Supply Company. The officers are: James Neale, president; Henry G. Brown, vice-president; J. Stuart Brown, treasurer, and J. H. Sanford, general manager.

Grant.—This mine of the Pittsburg Coal Company at Carnegie, which has been undergoing repairs for the past six months is about to resume work with a force of about 300 men. A new tipple has been run to the Panhandle railroad tracks, new electric motors are in position, tracks laid, etc.

La Belle Iron Works.—Three men were killed by an explosion of gas on November 11 in an old mine owned by this company. The mine has been flooded for years, but is being pumped out.

Rochester & Pittsburg Coal and Iron Company.—This company which has purchased more than 30,000 acres of coal property in Indiana County during the past two years, is now negotiating for 10,000 additional acres along Little Mahoning creek, in the neighborhood of Rochester Mills. The options are being taken by Walter Armes, mine engineer of the company, in the name of Lucien Robinson, the treasurer and general manager. The average price paid is $50 per acre. A new railroad will have to be constructed and a route has been surveyed from near Punxsutawney through Canor township, to Rochester Mills, then following Little Mahoning Creek to Hamill, turning off to Marion Center and Kellersburg. This line would be a branch of the Buffalo, Rochester & Pittsburg, which is owned and controlled by the same interests as the Rochester & Pittsburg Coal and Iron Company.

CLARION COUNTY.

Brady's Bend Iron Property.—The note in relation to this property, published in our columns November 2, needs some correction. The property is now in charge of Mr. Edward Wilkins Dewey, who has purchased it for his individual account, no one else being interested in it at present. The tract itself is of value from the deposits of iron ore and coal, though the old furnaces, rolling mills and other buildings are in a ruinous condition. The property has a varied and interesting history, concerning which we hope to present some notes hereafter.

TENNESSEE.

KNOX COUNTY.

East Tennessee Zinc Company.—This company has ordered new machinery and contracts are to be let immediately for the erection of the necessary building at the mines on Love's Creek, about four miles east of Knoxville. Some of the former owners of the property still retain some interest.

Knoxville Zinc and Smelting Company.—This company has recently sold 120 acres of its zinc properties to a company organized under the laws of New Jersey by New York men, known as the East Tennessee Zinc Company. The capital stock of the new company is put at $200,000. The officers are: Edwin T. Wade, of New York City, president; J. C. White, Knoxville, vice-president; J. F. Barry, New York City, secretary; the North American Trust Company, treasurer. The directory consists of the officers mentioned and J. W. Culton, of Knoxville, and two Eastern men. The property bought is situated at Love's Creek. The new company is organized to build a smelter.

PUTNAM COUNTY.

Northern Tennessee Coal and Lumber Company.—This company is to begin work on a great wooden tipple at the 3 openings it will make. A railroad 12 miles long will be built connecting with the Crawford line at Monterey. The railroad alone will cost $500,000, and the tipple over $100,000 more. The mines, to employ 500 men, will be equipped with electric undercutting machines and the tipple with Jeffrey movable screens. The coal will be shipped to Monterey, thence to Nashville for distribution over the Southern and Louisville & Nashville railroads. Capt. W. H. McKinley, of Pittsburg, Pa., is the president of the company, in which New York men are interested. The concern has been chartered with a capital stock of $100,000, and may increase this to $1,000,000 as soon as the conditions of development warrant. The Pittsburg firm, Barnes, Anderson & Co. owned 20,000 acres of the coal and lumber lands. The incorporators are: W. H. McKinley, of Pittsburg; C. E. Hutchinson, and A. B. McDonald, of Fairmont, W. Va.; W. W. Keaffer, of Danville, Ill., and Governor Benton McMillin, of Nashville, Tenn. The total territory owned by the syndicate is 50,000 acres. The land lies in Fentress and Overton counties.

Testing the new coal field has started with the diamond drill.

UTAH.

(*From Our Special Correspondent.*)

Ore and Bullion Settlements.—The settlements at Salt Lake City for the week ending November 9 are: gold, silver and lead ores, $253,100; bullion, gold bars and cyanides, $268,800.

BOX ELDER COUNTY.

(*From Our Special Correspondent.*)

Century.—Percy Williams, superintendent of this company's property in Park Valley, states the new mill began running full capacity on November 1. About 50 tons of ore will be put through the mill every 24 hours, and the estimated profit is $20,000 per month.

JUAB COUNTY.

(*From Our Special Correspondent.*)

Tintic Shipments.—The mines shipped the following cars of ore to the smelters for the week ending November 9: Eagle and Blue Bell, 3; Gemimi, 14; Carisa, 8; Lower Mammoth, 4; Mammoth, 1; Tesora, 1; May Day, 3; Yankee, 5; Uncle Sam, 5; total, 44; Tesora Mill, 2 cars concentrates.

Carisa.—This mine at Tintic has paid its usual monthly dividend.

Uncle Sam Consolidated.—The directors of this company with mines located in Tintic district met in

Salt Lake November 7, and declared the usual monthly dividend of $15,000.

SALT LAKE COUNTY.

(*From Our Special Correspondent.*)

Bingham Shipments.—The mines made the following shipments for the week ending November 9: Tiewaukee ore, 133,550 lbs.; Bingham Gold and Copper Company's ore, 841,040 lbs.; Phoenix ore, 111,410 lbs.; Commercial ore, 53,100 lbs.; Ben Butler ore, 25,000 lbs.

Bingham Consolidated Mining and Smelting Company.—This company shipped 200 tons matte during the week ending November 9 to the Butte and Boston smelter in Montana, and 100 tons to the Highland Boy smelter in Salt Lake valley.

United States Mining Company.—The capital stock has been increased from $10,000,000 to $12,500,000. The addition being made to take over the property of the Centennial Eureka Mining Company.

SUMMIT COUNTY.

(*From Our Special Correspondent.*)

Park City Ore and Concentrates Shipments.—These were of the week ending November 9: Ontario ore, 1,506,160 lbs.; Quincy ore, 1,238,900 lbs.; Anchor concentrates, 437,620 lbs.; California, concentrates, 122,200 lbs.; Silver King, concentrates and first-class ore, 2,189,000 lbs.; Daly West, concentrates and first-class ore, 1,920,250 lbs.

Daly West.—At a meeting on November 5th declared the usual monthly dividend of $60,000 payable on the 15. Manager Bamberger says the mine never looked so well. The usual tonnage is going regularly to market.

Silver King.—The usual monthly dividend of $100,000 was declared November 8. The mine is located at Park City. J. Daly is superintendent.

TOOELE COUNTY.

(*From Our Special Correspondent.*)

Stockton Shipments.—The mines made the following shipments for the week ending November 9: Catherine, ore, 36,270 lbs.; East Honorine, ore, 40,980 lbs.; Galena King, ore, 26,080; Ophie Hill, concentrates, 1,033,160 lbs.

Montana Consolidated.—Supt. Robert Mulhall of this mine, which is near Stockton, has ordered a hoist and will sink the shaft through the ledge. Thomas F. Keeley, of Chicago, has taken over the control or 260,000 shares of the $500,000 and work will continue through the winter. The property lies west of Senator Clark's Ophie Hill Mine that is making such a good record.

WASHINGTON.

FERRY COUNTY.

(*From Our Special Correspondent.*)

Lone Pine Surprise.—The lower Lone Pine tunnel at Republic is in 352 ft., and at 340 ft. struck pay ore mining from $15 to $24, with an average of $16.50 per ton. Five men employed on 2 shifts are taking out the ore. The width of the strike is about 4 ft. The ore proportions are 8 ozs. silver to 1 oz. gold.

Wasco.—The tunnel is in 180 ft., and has crosscut another streak of quartz, about 5 ft. wide, which assays about $50 per ton in copper, gold and silver.

Washington & Great Northern Railway.—This is the United States connection of the Victoria, Vancouver & Eastern Railway, now under construction, with a branch building 21 miles into Republic from Curlew. It will have its first temporary bridge across the Columbia River at Marcus by November 15. At Marcus the road connects with the Spokane Falls & Northern Railway, which runs from Spokane, Wash., to Rossland, B. C. It is expected to complete the branch into Republic by May 1 or sooner.

OKANOGAN COUNTY.

(*From Our Special Correspondent.*)

Prospectors are showing considerable activity in Moses District, on the south half of the Colville reservation, on the dividing line of Ferry and Okanogan counties, east of the big bend of the Columbia River. A number of small strikes of rich ore are reported.

Bodie.—This mine at Bodie Camp shows last smelter returns from ore from the open cut of $1,758 for 30 tons. The ore mined in the crosscut tunnel, 100 ft. below the apex of the vein and about 150 ft. south of the open cut, runs from $13 to $50 per ton.

FOREIGN MINING NEWS.

AFRICA.

TRANSVAAL.

The report of the Transvaal Chamber of Mines for the month of September shows that there were eight mines in operation—the Bonanza, the City and Suburban, the Geldenhuis Deep, the May Consolidated, the Meyer & Charlton, the Robinson, the Treasury, and the Wemmer. The total number of stamps running in the eight mills was 414, and the average time run 28.01 days. The total rock mined was 62,724 tons, and the ore milled 53,187 tons. The average duty per stamp per day was 4.58 tons. There were 41,518 tons of tailings cyanided and 3,959 tons of slimes treated. Of the slimes, 1,633 tons, at the Bonanza, were treated by cyanide, and 2,326 tons, at the Geldenhuis Deep, by the Betty process. The total yield, in fine gold, was: From mill, 21,766 oz.; from tailings, 9,872 oz.; from slimes, 298 oz.; total, 31,936 oz. The average result, based on tonnage of ore milled, was 0.6 oz. gold, or $12.40 per ton. All tons used in the Transvaal reports are short tons, of 2,000 lbs. each.

AUSTRALASIA.

WESTERN AUSTRALIA.

Gold Production.—The gold production for October is reported as 169,270 oz. crude. This makes a total for the 10 months ending October 31 of 1,330,110 oz. crude, against 1,284,982 oz. for the corresponding period in 1900, showing an increase of 45,128 oz., or 35 per cent, this year.

CANADA.

BRITISH COLUMBIA—BOUNDARY DISTRICT.

(*From Our Special Correspondent.*)

Chicago-British Columbia Mining Company.—The shaft on this company's Lake claim is now down 150 ft., and crosscutting is to start.

Golden Crown Mines, Limited.—This company, which is the reorganized Brandon & Golden Crown Company, has the same nominal capital as the old, $1,500,000 in $1 shares, but these were issued as paid up to 95c., leaving 5c. per share assessable. The first assessment of 1c. per share was generally met. After the next call is collected work will be resumed in the mine, which adjoins the Winnipeg and has shipped 2,241 tons of ore. The directors are: Judge Cumberland, president; George R. Caldwell, vice president; Senator Kirchoffer, F. Nation and J. B. Curran, all of Brandon; W. L. Parrish, Winnipeg; C. E. L. Jarvis, St. John, N. B., and W. A. Fuller, Spokane, Wash.

Jewel Gold Mines, Limited.—The work of sinking the new shaft on the Jewel is being pushed on, as is the running of cross-cuts at the 230-ft level of the old workings. Ore bins are being constructed, and other preparations made to ship ore, which will have to be hauled 4 miles to the railway. The ore will be sent to the B. C. Copper Company's smelter at Greenwood.

King Solomon.—Nearly 500 tons of carbonate copper ore have now been sent from this claim to the B. C. Copper Company's smelter. The values are known to be much higher than the general run of copper ore produced in the district. The ore body is being followed into the hill in which it occurs by a big open cut above the level of the ore bins.

Morrison Mines, Limited.—Two stopes have lately been opened at the 200-ft. level of the Morrison Mine. So far the ore has been proved to be 15 ft. in width. Ore bins have been put in, and arrangements made for a siding at the railway within half a mile of the mine. Negotiations have been in progress with managers of smelters for closing arrangements for treatment. Prospecting underground with the diamond drill is under way. There are 22 men on the mine pay roll.

No. 7 Mining Company.—Work lately in No. 7 Mine, owned by a New York company, has been restricted to drifting on the vein at both the 60 and 120-ft. levels. The vein gives 2 to 3 ft. of quartz, carrying zinc blende, galena, gold and silver. Ore is hauled about 4 miles to Canadian Pacific Railway and taken thence 3 miles to the Greenwood Smelter.

Ruby.—An open cut into the hill on the Ruby has opened 4 ft. of good copper-gold ore. Another cut, 480 ft. away, is also in nice-looking ore, whilst another shows the best ore yet found in quantity on the property. The prospects are favorable for the ore proving permanent with depth. F. W. Hayes, of Detroit, Mich., and associates have this property under option and have made one payment. The surrounding claims—Ruby Fraction, Ninety-Five Horseshoe and Sylvanite—have also been secured.

Snowshoe Gold and Copper Mines, Limited.—Development continues from the Railway tunnel on the Snowshoe. Much surface stripping is being done preliminary to opening 2 big ore quarries. Preparations are in progress for shipping regularly. New buildings are about completed. J. W. Astley, who heretofore has only visited the mine at frequent intervals as consulting engineer, has been appointed superintendent, will reside on the mine, and will direct operations. At present about 40 men are employed.

BRITISH COLUMBIA—CARIBOU DISTRICT.

Forty-third Mining and Milling Company.—Capt. Joshua Wright and several of his men returned recently from Manson Creek, where they have been opening up the mines of Slate and Manson creeks. A hydraulic elevator has been worked successfully during a part of the season, and it is expected that the mines will be worked on a much larger scale next season.

BRITISH COLUMBIA—EAST KOOTENAY DISTRICT.

Perry Creek, in this district is experiencing a revival of old days in her placer diggings. A deal was consummated recently by which a large section of the creek has become the property of Wisconsin capitalists, while a great many private individuals are said to be making good money on small claims.

Between 80 and 100 men are employed at the St. Eugene Mine, at Moyie; the shaft is down 100 ft. The manager of the property is authority for the statement that shipments will be resumed as soon as lead reaches £15 per ton.

BRITISH COLUMBIA—SKEENA DISTRICT.

British Columbia Pyritic Company.—This Victoria Company is the first to ship ore in quantity from the Skeena River. P. Herman & Company, of Port Essington, have the contract to ship ore from the company's mine on the Eckstall River, 35 miles from Port Essington. A tramway from the mines to the river bank was lately constructed by Herman & Company. There are at present about 1,000 tons on the dump. The principal development work is a tunnel, tapping the ledge at the 200-foot level.

BRITISH COLUMBIA—SLOCAN DISTRICT.

Arlington Mines, Limited.—At the recent annual meeting, in Slocan City, Frank J. Collom, managing director, and a number of stockholders were present. Upwards of 600,000 shares were voted. The financial statement for the past year showed the company's affairs to be in a healthy condition. The old board consisting of Messers. R. P. Rithet, A. B. Williamson, John Lawson, Thomas Binny, W. A. Macdonald and Frank J. Collom, was re-elected. Mr. Rithet is president, Mr. Lawson secretary, and Mr. Collom again managing director.

BRITISH COLUMBIA—VANCOUVER ISLAND.

Tyee Copper Company.—Work on the claims is being continued steadily. Recently a shipment was made of 200 tons by wagon to a point on the railway to Victoria, from thence by one of the Sound steamers to the smelter. A skip has been put in. The strike which was made some time ago has, it is said, been found to be quite extensive. Crosscuttings have demonstrated the fact that the company has a large amount of ore in sight.

BRITISH COLUMBIA—YALE DISTRICT.

Portland Mining Company, Limited.—This copper mining company has been organized at Terre Haute, Ind. The directors are: Andrew J. Crawford, Willard Kidder, Jacob C. Kolsem, Gustave A. Conzman, Charles N. Murphy, A. M. Higgins, M. T. Hidden, Dr. James P. English, all of Terre Haute, Ind., and Alfred W. Wright, of Vancouver, and John E. Bate, of Aspen Grove. The officers are: President, A. J. Crawford; vice-president, Willard Kidder; secretary, M. T. Hidden.

The company owns copper ore ledges located on the Portland, Quebec, Vicksburg and Covington claims, situated at Aspen Grove in the Princeton Division.

NEW ZEALAND.

The Mines Department reports the quantity of gold and silver exported from New Zealand for August and the 8 months ending August 31 as below, in ounces:

	Gold.		Silver.	
	1900.	1901.	1900.	1901.
August	23,774	30,742	22,755	55,995
Eight months	242,755	279,585	204,014	320,262

For the 8 months there was an increase of 36,830 oz. gold, and an increase of 104,248 oz. silver. The gold is reported in crude or bullion ounces; the total this year was equal to 254,158 oz. fine gold, or $5,253,450.

(*From Our Special Correspondent.*)

Hauraki Goldfield.—The chief returns during the past few weeks are: Waihi (August), £38,449 ($192,245), from 12,415 tons; Waihi (September), £38,350 ($191,750), from 12,880 tons; N. Z. Crown (2 months), £11,123 ($55,615), from 4,724 tons; Waitekauri (August), £3,296 ($16,480), from 2,062 tons; Waitekauri (September), £3,312 ($16,560), from 2,182 tons; Waihi-Union (August), £2,952 ($14,760), from 1,779 tons; Waihi-Union (September), £2,370 ($11,850), from 1,312 tons; Komata Reefs, £1,700 ($8,500), from 1,100 tons; Royal Oak, £1,096 ($5,480), from 100 tons; Mananu (August), £1,061 ($5,305), from 302 tons; Mananu (September), £1,065 ($5,325), from 443 tons. The returns are increasing, and now amount to about £60,000 ($360,000) per month. The Woodstock and Kauri Freeholds Company's batteries have resumed crushing, and the returns from these batteries, with that from the Talesman Company's new battery, will increase this figure.

Mining Dispute.—The Arbitration Court has been sitting at various goldfield centers hearing evidence in the dispute between the Hauraki Miners' Union and the mining companies. The court has finished its sittings, and will soon give its decision. In the meantime, this dispute has caused an unsettled feeling both in the local and English sharemarket, and in the various mining centers of the Peninsula.

MINING STOCKS.

Complete quotations will be found on pages 654 and 655 of mining stocks listed and dealt in at:

Boston.	Philadelphia.	Montreal.
Colo. Springs.	San Francisco.	Mexico.
New York.	London.	Paris.

New York. Nov. 15.

Little new can be said of the market, although prices, especially of copper shares, show a slight recovery from last week. Trading, however, has been only moderate, notwithstanding the tips from Boston to buy. Amalgamated rose to $89, but later declined to $86⅜. Anaconda went to $34½@$35½, which is a gain from last week. The curb coppers have been active, notably Union, of North Carolina. Over 50,000 shares of this stock were reported sold at $6@$7½. Some of this buying is attributed to a large electric manufacturing company, which is understood to be interested in other copper properties. British Columbia sold at $14, Tennessee at $13 and White Knob, of Idaho, at $22¾.

A sale of Ontario silver of Utah was made at $10½. Alice, of Montana, holds firm at 45c.

Standard Consolidated of California receded to $3.85 from $4.

The Colorado shares are suffering from a lack of demand, and a weak Western market. In the Cripple Creek group Isabella dropped 5c to 40c., and Anaconda Gold 1c. to 25c. Gold Dollar re-appeared at 18½c. Mollie Gibson is uninteresting, and sales are reported between room traders at 25@23c. Iron Silver, of Leadville, sold again at 63c., and Breece at $1.25.

The Comstock shares have been weakened by a new crop of assessments. Consolidated California & Virginia went off 5c. to $1.70, Best & Belcher at 16c., and Comstock Tunnel bonds and stock at 6c.

Boston. Nov. 13.

(From Our Special Correspondent.)

It really looked at one time early in the week as if Boston would enjoy a boom in copper shares, but the activity and strength were short lived. The spark of life appeared last week and was due in a large measure to efforts on the part of traders to interest the public. The strength of Amalgamated copper was an attributing cause also. The hand of Tom Lawson was plainly seen and a circular which his house put out Saturday put everybody on the *qui vive*. As a result there was a good trading market for a few days, but efforts to bring the public into the market are likely to prove hopeless for a while yet. The bulls argue that dulness accompanies the decline, while on the other hand advancing prices encouraged trading. Brokers are only hoping that the last start is not another flash in the pan.

The uncertainty with regards to the ultimate price of copper is the barrier which presents itself to the investor and the feeling that the metal will be cut prevents new commitments to the long side. From every evidence that can be obtained, the Amalgamated people are straining every nerve to maintain the price. Curtailment at the Butte mines is being carried to the limit. The Boston & Montana has about 100 men at work with the smelter at Great Falls idle. The normal number is about 2,000. The Parrot and Anaconda are running about one-half their force.

Utah Consolidated stock of record December 6 will receive dividend number 2 of $1.25 per share. The London company has declared a dividend of 5s., which accrues to the American stockholders. The stock rose $2 1-2 to $25. A great splurge was made in Arcadian Tuesday and the price rose from $5 Monday to $9, with reaction to $6 1-2 the same day. No news accompanied the move and it was looked upon as pure manipulation. In fact, it was told that a selling order of $7 1-2 could not be negotiated when 9 was quoted. Tri-mountain was another conspicuous stock, rising in one day from $42 to $48 1-2 with reaction to $45 1-2 the same day. This evidently was another piece of manipulation. Copper Range rose $3 to $63 in sympathy. Later, Tri-mountain sold at $43 and Copper Range at $61. Trinity holds well above $25 and Lawson talks big of this, his specialty. Osceola has risen from $97 1-4 to $101 3-4, but fell back to under $100. Mass has ranged between $23 1-2 and $25 1-2. Centennial spurted from $16 to $18 3-4, but reacted to $17, and Adventure from $22 1-2 to $24 1-2. Bingham touched $30.

Colorado Springs. Nov. 10.

(From Our Special Correspondent.)

The market was very much the same as it has been for some time past, not very much interest being taken. On the whole, however, the market showed a reaction from several days ago. At the first of the week the market was quite brisk, but fell off considerably toward the last and on Saturday was very dull. There seems no good reason for this from the condition of the district, as the output for October was very good indeed. There was no call on Tuesday and only one on Wednesday. A deal is reported on the Elkton in which the stock is to be sold for $2.75 per share, but there seems to be considerable doubt of the deal going through. Elkton sold as high as $1.64 in the middle of the week, but declined to $1.59 at the end. El Paso went as high as 80⅞c., but declined to 76¼c. on Saturday.

The total sales for the week amounted to 1,000,286 shares, the value being $229,612.

San Francisco. Nov. 9.

(From Our Special Correspondent.)

The market has been quiet as usual. The only sensation was a sharp rise in Best & Belcher, which jumped yesterday from 15 to 21c. a share, dropping back to 19c. at the close. This gave some interest to mattes, but did not affect other stocks much.

Some quotations noted are: Consolidated California & Virginia, $1.75; Ophil, 79@80c.; Silver Hill, 29c.; Best & Belcher, 21c.; Mexican, 20c.; Gould & Curry, 13c.

The sales on regular call at the San Francisco Stock Exchange for the year to date compare as follows:

	1900.	1901.
January, shares	164,400	312,385
February.	112,000	132,585
March.	252,730	152,220
April.	121,500	180,625
May.	171,015	151,020
June.	129,505	107,340
July.	84,110	163,980
August.	163,985	143,940
September.	113,350	86,710
October.	229,790	127,150
Total.	1,542,385	1,557,955

The light business in September and October brought this year's total very nearly down to that of 1900; the difference for the 10 months being only 15,570 shares.

The Providence Mining Company of Nevada County has levied an assessment of $1 per share, for the purpose of reopening and developing the mine.

The Belcher Mining Company has levied an assessment of 10c. per share.

On the Producers' Oil Exchange prices were fairly well maintained and a good deal of business was done, although dealing was concentrated on a few stocks. Some quotations noted are: Hanford, $102; Peerless, $5; Sterling, $1.30; Aztec, $1; Reed Crude, 35c.; Lion, 11c. The favorite stocks were Lion, Reed Crude and Aztec, the latter coming into notice for the first time.

London. Oct. 29.

(From Our Special Correspondent.)

The discussion with regard to the future of the London Globe Corporation continues to occupy the attention of people interested in the Whitaker Wright collapse. The proposition of Mr. Wright, mentioned by me last week, to amalgamate this corporation with the British America Corporation and the Standard Exploration Company, has been received very well by large sections of the shareholders, who see a chance of getting some of their money back without being first saddled with an assessment. The daily financial papers are in favor of his scheme, for it will flick up a little excitement in the market and do something towards ending the present dulness. The more serious section of the financial press as well as the more thoughtful shareholders continue to press for a compulsory liquidation and public examination of the directrs. The petition to effect this will be presented this week in court, and it is quite likely that it will be granted. The petition is being presented by Stock Exchange creditors who are desirous of receiving the moneys owing to them from speculative accounts. The daily press and Mr. Whitaker-Wright keep telling the shareholders that their interests and their creditors' interests are widely divergent, and advise shareholders to beware of any proposition put forward by these creditors. For my own part I cannot see where these interests clash in the present case, and the statement seems to be made solely with a view of preventing shareholders from joining in the petition for compulsory liquidation presented by the creditors.

The mining market generally has been as dull as usual nowadays. The West African market is still very slumpy, and no other section shows much life. Last week I mentioned that chartered and other Rhodesian shares had been specially weak on rumors circulated about Mr. Rhodes' health. This weakness continues, and chartered shares are specially dull. Nobody, however, can give any definite opinion as to the cause of these movements, but it appears that the selling comes from the same continental source that the selling of Rio Tinto and De Beers came from, and it has nothing to do with English market conditions.

The present state of the mining industry centering in London is well exhibited by the yearly report of Messrs. Fraser & Chalmers, of London, which has just been published. The works have not been fully occupied during the year, owing to the political situation in South Africa, though orders from other parts of the world have come forward satisfactorily. The continuance of the war has led to a considerable accumulation of stocks at the works and in South Africa, consisting entirely of machinery awaiting delivery. The value of these accumulations amounts to over £300,000. The report also mentions that the funds in hand have been greatly increased during the year. This has been caused firstly by the issue of £63,000 new capital; and, secondly, by the sale of the company's interest in the American company's business. The price received for the interest was £255,000 in cash in redemption of debentures, and $1,500,000 in 7 per cent preference shares in the Allis-Chalmers Company. The sum of money received has been mainly devoted to extinguishing the debentures of the English company, as far as has been possible to do so. The consolidation of the American company with the Gates and Allis companies has thus been of considerable financial benefit to the English company.

Paris. Nov. 3.

(From Our Special Correspondent.)

The mining stock department of the Bourse continues to shw heaviness and depression, and there is no speculation. Business upon the Bourse is at a complete standstill, the block there being aggravated by the action of the Government in practically closing the *coulisse*, and making it necessary to do all business through the *agents de change*, who are only 70 in number, and who, if all that is said of them be correct, are not very well qualified for the position they hold and the monopoly given them by the Government. One consequence of the unwise monopoly given to the *agents de change* is that capitalists who have lost heavily, and are obliged to pay large differences, are compelled to sell directly abroad. For the most part they have sold in London. For example, it is estimated upon what seems to be good authority that during the slump about 100,000 De Beers shares have been sold in London, and about 50,000 Rio Tinto shares. It is reported that much of this Rio Tinto stock has been sold to New York operators.

The proposal of the De Beers Company to divide its shares into common and preferred is well received. There is some criticism of the details of the plan, and it may be slightly modified. The general plan, however, will doubtless be carried out. The subvention in stock to the life governors seems large, but the extinction of their claims will be in the end an advantage to the stockholders. The proposed absorption of the Jagersfontein Company appears prudent.

The general uncertainty and depression gives a sad aspect to the Bourse; and yet—aside from the Russian trouble—no one can say definitely why. It is simply that confidence in the future is wanting. And yet few or none can put the situation in words, or explain definitely the position.

Everyone shakes his head—and values fall. AZOTE.

DIVIDENDS.

Name of Company.	Latest Dividend Per Date.	Per share.	Total.	Total to date.
*Carisa, Utah	Nov. 15	.03	15,000	30,000
*Consolidated, Colo.	Nov. 25	.01	19,000	133,000
*Gold Coin, Colo.	Nov. 25	.03	30,000	930,000
*Gwin, Cal.	Nov. 20	.05	5,000	470,000
*Homestake, S. Dak.	Nov. 25	.25	52,500	10,558,750
Homestake, extra	Nov. 25	.25	52,500	.....
Lehigh Coal & Navigation	Nov. 27	1.50	430,399	19,377,788
*New Leadville Home, Colo.	Nov. 20	.00⅝	12,500	225,000
*N. Y. & Hond. Rosario.	Nov. 23	.10	15,000	1,655,000
N. Y. & H. Rosario, extra	Nov. 23	.10	15,000	.....
Ontario Silver, Utah	Dec. 20	.30	45,000	14,735,500
†Sand Fork Pet., W. Va.	Nov. 15	.03	30,000	30,000
†Standard Con. Cal.	Nov. 21	.10	17,839	4,035,458
*Standard, Idaho	Nov. 22	.05	25,000	2,440,000
*Standard Oil.	Dec. 16	8.00	7,660,000	119,585,000
Uncle Sam, Utah	Nov. 15	.03	15,000	45,000
†U. S. Steel com.	Dec. 20	1.00	5,082,347	10,143,462
West Shore Oil, Cal.	Nov. 30	.05	5,000	15,000

*Monthly. †Quarterly.

ASSESSMENTS.

Name of Company.	Location.	No.	Delinq.	Sale.	Amt.
Alta	Nev.	..	Nov. 22	Dec. 20	.05
Badger	Ore.	..	Nov. 30	.....	.05
Belcher	Nev.	..	Dec. 8	Dec. 31	.10
Black Hawk	Utah.	..	Nov. 18	Dec. 9	.001½
Boulder	Mont.	..	Nov. 11	Nov. 26	.001
Bullion	Nev.	59	Oct. 24	Nov. 14	.03
Butler	Utah.	1	Nov. 9	Nov. 29	.00½
Cantra Casta Coal	Cal.	1	Nov. 9	Nov. 25	0.3
Goleta Con.	Cal.	3	Nov. 29	Dec. 28	.10
Good Hope Placer	Utah	..	Nov. 6	Nov. 26	.02
Gould & Curry	Nev.	96	Oct. 30	Nov. 28	.10
Gonyon	Utah.	..	Nov. 1	Nov. 22	.00¼
Melcher	Utah.	4	Nov. 8	Nov. 25	.01
Mt. Blanc Con.	Cal.	..	Nov. 16	.....	.00⅛
Navajo	Utah.	..	Nov. 7	.....	.00¼
New Erie	Utah.	5	Nov. 8	Nov. 25	.00½
Old Home Con.	Cal.	..	Nov. 18	.....	.01
Orient	Utah.	1	Nov. 11	Nov. 29	.01
R. G. W.	Utah	11	Nov. 5	Nov. 21	.00½
Sharp	Utah	4	Nov. 19	Dec. 16	.03
Shower Con.	Utah.	5	Nov. 30	Dec. 23	.02
Silver Cloud	Utah.	5	Nov. 11	Nov. 30	.00½
Tetro	Utah.	21	Dec. 7	Dec. 31	.01
Thorpe	Cal.	11	Nov. 16	Dec. 9	.01
United Sunbeam	Utah.	2	Nov. 7	Nov. 25	.10
Utah Con.	Nev.	..	Nov. 30	Dec. 24	.05
Yellow Jacket	Nev.	9	Oct. 22	Nov. 27	.10
Yuba Con.	Utah.	4	Nov. 11	Dec. 2	.00¼

COAL TRADE REVIEW

New York. Nov. 15.

ANTHRACITE.

"Demand good, car supply poor," briefly summarizes the present condition of things in the anthracite trade. In spite of all the heavy buying early in the season, the market is very strong and all the coal shipped from the collieries is taken readily. The car shortage is most marked in the supply of box cars for Western shipments, but regular coal cars are also scarce and shipments from the mines to tidewater points are restricted in consequence.

Demand in Lake Superior and Chicago territory has picked up with the arrival of cold and stormy weather and is now quite brisk. The fear of a short supply on docks at the close of navigation has lead to a very heavy movement up the lakes during the past few weeks and the arrivals to date considerably exceed those for the corresponding period last year, though behind those for 1899. The docks at both Duluth and Chicago will undoubtedly be cleaned up before navigation opens next spring. The movement of coal from the docks to inland points is seriously hampered by the poor car supply. Along the lower lake ports and in Canadian territory retail demand is active and trade is generally in excellent shape. Along the Atlantic seaboard demand has improved. Bad weather and the poor supply of vessels at New York Harbor ports and Philadelphia, has hampered the coastwise movement, but most yards at points beyond Cape Cod have now supplies for the winter and the shoal water ports are about out of the market. The line trade shows an active demand, but feels the car shortage, shipments being embargoed to many points off the main lines.

With domestic demand so good and prices firmly maintained the large companies are not seeking export business. It is stated that the Philadelphia & Reading Company has been negotiating with French parties for a shipment abroad of 100,000 tons. The Reading, however, is reported to have practically no coal in storage at Port Richmond and hesitates to contract for the delivery of 100,000 tons.

Labor troubles at the mines are now of slight importance, with the employees of the Temple Iron Company at work again, and no serious difficulties are expected before next spring. It is quite likely that before April 1 the operators and the United Mine Workers will come to some sort of an informal agreement and that there will be no strike after all. At the same time it is not likely that the anthracite operators will consent to such an arrangement as now controls the relations of the operators and miners in the Pennsylvania, Ohio, Indiana and Illinois soft coal mines. That arrangement has caused much complaint from the operators in some fields, and there is an even greater diversity of conditions to be covered by a general agreement in the anthracite than in the bituminous fields. At present the mines are as busy as car supply will permit. The output for October is estimated at 4,250,000 tons, and the total tonnage to November 1 was about 1,000,000 tons ahead of last year.

We quote for free-burning white ash coal, f. o. b. New York Harbor shipping ports: Broken, $4; egg, $4.25; stove and nut, $4.50.

BITUMINOUS.

The Atlantic seaboard soft coal trade shows not the slightest slackening in demand. Car supply remains short, the railroads promise little or no help for the immediate future, and orders are accumulating in the hands of producers, who find it difficult to judge of the chances for supplying their customers. Car supply at the mines is not only short, but irregular, sometimes up to 75 per cent the total number wanted, and then down to below 50 per cent. Consumers in many quarters are in actual distress for coal, and under such conditions producers give preference to the neediest. There are believed to be many duplicate orders on the market, consumers trying to get coal promptly by ordering of several concerns. These orders would probably be weeded out in a short time by a fairly prompt supply of cars.

The Far East wants a lot of coal, but has probably better supplies than any other consuming territory. The demand along Long Island Sound continues very heavy and but a very small percentage of the orders given can be handled promptly. At New York Harbor ports, also, there is now a shortage of coal, and some advanced prices have been paid to help out shipments to regular customers. All rail trade continues to call for more coal than it is receiving.

Transportation from the mines to tidewater is slow and this is given as one cause of the car shortage. Car supply at the mines is still around 50 per cent of the total number wanted. In the coastwise vessel market vessels continue in very short supply at the loading ports, particularly at Chesapeake Bay points. The poor arrivals are in part due to bad weather. Many vessels have taken off-shore business. Coastwise freight rates are firm and higher. We quote current rates from Philadelphia as follows: Boston, Salem and Portland, 80c.; Providence, New Bedford and the Sound, 65c.; Wareham and Bath, 90@95c.; Lynn, Newburyport and Portsmouth, 90c. Rates from the further lower ports are 15c. and even 20c. higher. Prices are very firm. A few cargoes have been sold lately at 25c. above the market, but in general the association figures are still the standard price.

Birmingham. Nov. 11.

(*From Our Special Correspondent.*)

The production of coal in Alabama is increasing some, and there is a better demand. Prices, however, do not improve. The production is larger than it has been at any time in over six months, while shipments and home consumption are picking up.

During the past week J. B. Finley, president of the Monongahela Consolidated Coal and Coke Company, of Pennsylvania, and George W. Thiess, secretary-treasurer of the same company, were in the Birmingham District looking over the properties of the Corona Coal and Iron Company, of which they are president and secretary respectively. The Corona Company will expend about $200,000 in improvements about the works in this State, and it is intended to enlarge the production, which has been about 400,000 tons a year. This company is supplying four-fifths of the coal that is being shipped from this State to the Louisiana markets via the Mississippi River. The railroads in this district are not furnishing all the cars that could be used, but there are cars enough for coal from the mines to the furnaces.

The production of coke is increasing. The Semet-Solvay Company has its new coke ovens at Ensley in operation.

Cleveland. Nov. 12.

(*From Our Special Correspondent.*)

It is now quite evident that the coal shippers who are sending their material to the Northwest by the lake routes will not be able to fill a single contract while relying entirely upon this channel. The coal has become so scarce that a shipment of a cargo is an uncommon rather than an ordinary thing as is expected this time of the year. The supply is constantly dwindling until to-day one shipper received 5 cars of coal when he should have had 100 cars under normal circumstances. This is hardly a just criterion by which to judge the market but an estimate based upon such calculations would not be far away. The shippers almost without exception are getting now only a small proportion of that coal which they actually need to meet their requirements. Since all of them are to be short on their season's shipment it is evident that the all-rail route to the Northwest will be relied upon to a great extent during the winter. While this condition prevails and while boats are in excess of the demand for them an increase in the rates of carriage was paid this week, three cargoes having been put in by a Milwaukee firm at 70, an advance of 10 cents on the ton. The advance is generally conceded to have been a useless mistake, but it has pinned the other shippers to it and the striking situation is now presented of double the rate being paid to Milwaukee as obtains to the head of the lakes. The shortage of coal along the lakes is due in part to a great scarcity of fuel coal on the railroads. Some cars have been confiscated during the past week and such practices are regularly resorted to because the fuel is so low. Some boats are able to get coal enough to last them to the rivers only.

Pittsburg. Nov. 13

(*From Our Special Correspondent.*)

Coal.—There is but little change in the coal situation this week. The Pittsburg Coal Company is rushing shipments to the lake ports for the Northwestern trade, but is still badly handicapped by a shortage of cars. Despite the strenuous efforts being made it will be impossible to fill the contracts taken. The prices for all grades of coal are firm, but no changes have been announced by either combination.

Connellsville Coke.—The production of coke last week was a trifle over that of the previous week, the total tonnage being about 233,720 tons. Of the 21,833 ovens in the region 19,830 were active and 2,003 were idle. Prices remain unchanged, standard Connellsville coke being quoted at $2 and foundry at from $2.50 to $2.75 a ton. The shipments for the week aggregated 10,896 cars distributed as follows: To Pittsburg and river tipples, 3,730 cars; to points west of Pittsburg, 5,178 cars; to points east of Connellsville, 1,986 cars.

Foreign Coal Trade. Nov. 14.

Freight rates from the United States are a little firmer. Of the charters booked we note one from Philadelphia to Marseilles, France, at 9s. 3d ($2,22).

No new contracts of special importance are noted this week. Shipments to South America and the West Indies continue good.

Messrs. Hull, Blyth & Co., of London and Cardiff, report under date of November 2, that at Cardiff, owing to the prospect of trouble with the miners, the coal market is very much upset and quotations vary considerably. Large coals have increased but the feature of the market is smalls, which have bounded up in price. Quotations are: Best Welsh steam coal, $4.44@$4.68; seconds, $4.20; thirds, $3.84; dry coals, $3.60; best Monmouthshire, $3.72@$3.84; seconds, $3.36@$3.48; best small steam coal, $3.12; seconds, $2.64; other sorts, $2.28.

The above prices for Cardiff coals are all f. o. b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f. o. b. Newport, exclusive of wharfage but inclusive of export duty, and are for cash in 30 days, less 2½ per cent discount.

Rates of freight ore are fairly steady, with a slightly firming tendency. Some rates from Cardiff are: Algiers, $1.25; Marseilles, $1.30; Genoa, $1.52; Naples, $1.38; Port Said, $1.26; Singapore, $3.12; Las Palmas, $1.44; St. Vincent, $1.32; Rio Janeiro, $2.64; Santos, $2.88; Buenos Aires, $2.70.

CHEMICALS AND MINERALS.

(For further prices of chemicals, minerals and rare elements, see page 656.)

New York. Nov. 15.

Heavy Chemicals.—Prompt shipments are chiefly on contract, though some sales made at firm prices, are noted to fill a hand-to-mouth demand. Domestic products are attracting more attention and in many instances makers have booked good-sized future orders at satisfactory prices. For 1902 alkali 77½@80c. per 100 lbs., f. o. b. works, has been placed, and for caustic soda, 1902-3, $1.87½@$1.95 per 100 lbs., f. o. b. works. Bleach has also brought good prices. Chlorate of potash has been in better request for next year's delivery. Foreign products find competition keen for 1902 and 1903 business. Further contracts for next year's bleach have been taken at $1.75 up per 100 lbs., according to make, but these orders are few as most of the heavy consumers are already booked. Chlorate of potash is uneasy, and it is reported sales over 1902 have been made at $7.50@$7.75 per 100 lbs. for Continental makes. It is noteworthy that our imports of all foreign makes are decreasing rapidly, and so far this year are only a little more than one-half the imports in 1900. Moreover a large part of these imports have been re-exported, showing that the domestic production is growing. Alkali and caustic soda are similarly situated, the imports of each having decreased largely as compared with last year. This also proves that the capacity of our own works has been increased and that the time is not far distant when imports will practically cease. It is not many years ago that we depended upon foreign manufacturers for all our supplies, but now they have become apprehensive as the situation has changd materially. In fact, we have exported some of our own product to their territory, in England and Australia.

Acids.—Buying for immediate consumption has improved, while 1902 contracts have been booked on basis of quotations. Muriatic shows an appreciable amount of business for next year's delivery. Oxalic continues weak, and for 1902 sales are reported as low as $4.87½ per 100 lbs. Since the collapse of the oxalic combination the market has been demoralized and prices quoted are among the lowest on record. Blue vitriol manifests the strength that usually precedes an advancing market.

Quotations are per 100 lbs. as below, unless otherwise specified, for large lots in carboys or bulk (in tank cars), delivered in New York and vicinity:

Acetic, com'l 28%....	$1.80	Oxalic, com'l.....	5@5.25
Blue vitrol.....	4.75@4.87½	Sulphuric, 50 deg., bulk ton.	14.00@16.00
Muriatic, 18 deg.....	1.50	Sulphuric, 60 deg.....	1.00
Muriatic, 20 deg.....	1.62½	Sulphuric, 60 deg., bulk	18.00@20.00
Muriatic, 22 deg.....	1.75	Sulphuric, 66 deg.....	1.20
Nitric, 36 deg.....	3.87½	Sulphuric, 66 deg, bulk.	21.00@23.00
Nitric, 38 deg.....	4.12½		
Nitric, 40 deg.....	4.37½		
Nitric, 42 deg.....	4.62½		

Brimstone.—The situation is practically unchanged. Best unmixed seconds soon to arrive are quoted at $24 per ton, and best thirds $21. Shipments are $23@$23.25 per ton for best unmixed seconds and $20@$20.25 for thirds. Abroad the market continues firm and prices are strengthened by higher freights.

The exports of brimstons from Sicily in September are reported by Emil Fog & Sons at 34,288 tons, which are the largest since May. Of this quantity the United States is credited with 17,197 tons, of which 12,297 tons were best unmixed seconds, and 4,900 tons best thirds. Stocks in Sicily on September 30 were 264,757 tons, being the heaviest this year, and showing an increase over last year of 44,114 tons, or 17 per cent due chiefly to the heavier holdings at Girgenti.

Pyrites.—A good demand characterizes this market, which continues firm. Word is received from British Columbia that the first consignment of 75 tons iron pyrites has recently been made to the Victoria (B. C.) Chemical Company. Regular shipments from the property of the British Columbia Pyrites Company on the Huxtall River, in the Skeena country, are to begin early next year, and it is said quantities will be

sent to San Francisco for sale to local consumers. We quote, per ton, as follows: Mineral City, Va., lump ore, $4.90 per ton, and fines, 10c. per unit; Charlemont, Mass., lump, $5, and fines, $4.75. Spanish pyrites, 12@14c. per unit, delivered ex-ship New York and other Atlantic ports. Spanish pyrites contain from 46 to 51 per cent of sulphur; American, from 42 to 44 per cent.

Sulphate of Ammonia.—Quiet. Orders for gas liquor (24@25 per cent) to arrive can be placed at $2.77½@$2.80 per 100 lbs., while spot sales have been made at $2.82½. Cables report a firm market abroad, and producers' quotations are equivalent to $2.30@$2.34 per 100 lbs., according to make, f. o. b. English ports.

Potash Salts.—The German Kali Syndicate is contending with an aggressive competitor, a Magdeburg concern, that refused to join the combine on the basis of the regulated allotment of production. In order to retain its position in certain foreign markets it is asserted that the syndicate has cut prices; but in the United States no change has yet been made, and probably will not be for two or three months. Meantime the Magdeburg concern is soliciting orders for 1902 delivery at reduced prices. To show the important position held by the United States as a consumer, we give below the shipments to this country as made by the German Kali Works in 1900 and 1899:

	1899.	1900.	Changes.
Muriate of potash	48,631	63,413	I. 14,782
Sulphate of potash	9,093	12,730	I. 3,637
Double manure salt	5,430	7,047	I. 1,617
Manure salt, 20 per cent	20,519	47,151	I. 26,632
Sylvinit	10,831	3,390	D. 7,441
Kainit	124,022	171,588	I. 47,566
Total tons	218,526	305,319	I. 86,793

The deliveries during the present year show a further improvement, and when completed will likely record a considerable increase over the two previous years. In the 9 months ended September 30 the imports of muriate of potash alone show an increase of 11,968,981 lbs., or 16 per cent over the corresponding period in 1900. A small quantity has been re-exported, but the bulk has been delivered to consumers who had placed contracts some time previously.

Nitrate of Soda.—The market continues dull at $1.89 per 100 lbs. for spot, and $1.92½@$1.95 for futures, according to position. These prices are below the present cost of importing, but as stocks in hand are large importers are not worried over the situation. Cables report the shipments this month from the West Coast of South America very heavy. On the coast the market is a little weaker, though freights are unchanged. The future prospects of nitrate of soda will depend largely upon the European consumption. In October the shipments from the coast to Europe were 127,300 tons, making a total for the 10 months of 787,139 tons, against 850,490 tons in the same period of last year; showing a decrease of 63,351 tons or 7.4 per cent. Loadings for Europe on November 1 were 68,200 tons, which compare with 105,929 tons on October 1, and 149,044 tons on November 1, 1900. Demand is reported slow, but sellers are firm as regards prices.

Phosphates.—Continental buying for 1902 delivery has been good at full prices. In the United Kingdom, where the lower grades of phosphates are largely consumed, orders are not plentiful just now, as manufacturers have already placed the bulk of their season contracts. The imports into Great Britain during the current year are less than 1900; but it is thought 1902 will show an improvement.

The first cargo of phosphate rock ever shipped from Norfolk, Va., to a Japanese port was sent recently to Hiogo. The freight rate is high.

Florida stuff is in better request, though miners are still chary about booking orders for long periods at present low prices. High grade rock exports so far this year show a good increase over 1900. Continental shipments were the largest, though the Mediterranean and United Kingdom ports also show an improvement, while Baltic buying has been less. Land pebble and Peace River phosphates find their best foreign demand in France, Italy and Sweden.

Exports of Florida high grade rock from Savannah in October were the largest this year, amounting to 20,872 tons, which compare with 10,955 tons in the same months last year; showing an increase of 9,917 tons, or over 47 per cent. The exports in the 10 months ending October 31 this year totaled 134,610 tons, against 96,672 tons in the corresponding period in 1900; an increase of 37,938 tons, or 28 per cent. It is noteworthy that the shipments so far this year are fully 9 per cent greater than for the whole of 1900, when 121,724 tons were reported. In the current year the exports were distributed as follows: To Germany, 72,440 tons; Holland, 22,860; Belgium, 14,959; Italy, 8,340; Sweden, 3,154; Denmark, 2,600; Austria, 2,014; United Kingdom, 8,343 tons; total, 134,610 tons. Of this total the Dutton Phosphate Company shipped 55,595 tons, or over 41 per cent, and Schilmann & Bene, 34,786 tons, or 26 per cent, the remainder being credited to 6 other firms.

Tennessee rock continues in good demand, and, judging from shipments already made, the exports this month will show a large total. In October the exports from Pensacola were 7,721 tons, making a total for the 10 months this year of 108,330 tons, chiefly to France and Italy. Prices are firm, and it is thought will advance next year.

South Carolina miners report steady buying at satisfactory prices. Exports from Beaufort alone so far this year exceed 30,000 tons, principally to England and France.

Coastwise shipments from Charleston and Beaufort are pretty good. Some interference with prompt deliveries by railroad has been occasioned by the limited car supply. Prices on the whole remain as last week.

We quote:

Phosphates.	Per ton F. o. b.	C. i. f. Un'd Kingdom or European Ports. Unit.	Long ton.
*Fla. hard rock (77@80%)	$6.50@7.00	6¾@7¼d	$10.53@10.92
*Fla. land peb. (68@73%)	3.00@3.25	5 @6d	7.00@ 8.40
*Fla. Peace Riv. (58@63%)	2.25@2.50	5 @5½d	6.00@ 6.60
†Tenn....78@80%), export.	3.25	6¾@7d	10.53@10.92
†Tenn.....78% domestic.	2.75@3.00	.....	.....
†Tenn.....75% domestic.	2.70@2.75	.....	.....
†Tenn....70@72% domestic.	2.10@2.25	.....	.....
‡So. Car. land rock	3.50	5 @5½d	6.00@ 6.60
‡So. Car. river rock	2.75@3.25	.....	.....
Algerian, rock...(63@70%).	.....	6 @6½d	8.04@ 8.70
Algerian, rock...(58@63%).	.....	5 @5½d	6.00@ 6.60
Tunis, Gafsa.....(58@63%).	.....	5 @5¼d	6.00@ 6.30

*Fernandina. †Mt. Pleasant. ‡On vessels Ashley River.

Freight rates from Florida ports are about as follows: To Baltic ports, $5; Continental, $3.24@$3.72; Mediterranean, $4.20@$4.56; United Kingdom, $3.84. From Savannah, Ga., to Continental ports, $3.18.

SLATE TRADE REVIEW.

New York. Nov. 15.

The list of prices per square of No. 1 slate, standard brand, f. o. b. at quarries in car-load lots, is given below:

Size, Inches	Monson or Br'nville.	Bangor.	Bangor Ribbon.	Alb'n or Jackson Bangor.	Chap'n Keystone.	Peach Bottom.	Sea Gr'n.	Unfad'g Green.	Red.
	$.	$.	$.	$.	$.	$.	$.	$.	$.
24 x 14....	6.50	3.50	3.00	3.25	...	5.30	3.00	...	....
24 x 12....	6.60	3.50	3.00	3.25	4.00	5.50	3.00	3.75	....
22 x 12....	6.60	3.50	3.25	3.50	...	5.50	3.00	3.75	....
22 x 11....	6.50	3.75	3.25	3.50	4.00	5.50	3.00	4.00	....
20 x 12....	6.90	3.75	3.25	3.50	...	5.50	3.00	3.75	....
20 x 11....	6.80	...	...	3.75	...	5.50	3.00	...	....
20 x 10....	6.80	4.25	3.50	3.75	4.00	5.60	3.00	4.25	10.50
18 x 12....	6.80	3.75	3.25	3.50	...	5.50	3.00	3.75	....
18 x 11....	7.00	...	...	...	...	...	3.00	3.75	....
18 x 10....	7.00	4.25	3.50	3.75	4.00	5.60	3.00	4.00	10.50
18 x 9....	7.00	4.50	3.50	3.75	4.00	5.60	3.00	4.25	10.50
16 x 12....	6.80	3.75	...	3.50	...	...	2.90	3.75	....
16 x 10....	7.00	4.00	3.50	3.75	4.00	5.60	2.90	4.00	10.50
16 x 9....	7.00	4.25	...	3.75	4.00	5.60	2.90	4.25	10.50
16 x 8....	7.00	4.25	3.50	3.75	4.25	5.60	2.90	4.25	10.50
14 x 10....	6.60	3.75	3.25	3.25	...	5.50	2.70	3.75	10.50
14 x 9....	6.50	...	...	...	...	...	2.70	3.75	10.50
14 x 8....	6.60	3.75	3.25	3.25	4.00	5.30	2.70	4.25	10.50
14 x 7....	6.40	3.75	3.25	3.25	3.75	5.30	2.50	4.25	10.50
12 x 10....	5.75	...	...	...	...	...	2.50	3.25	....
12 x 9....	5.60	...	...	...	...	...	2.50	3.25	....
12 x 8....	5.50	3.50	...	3.00	...	5.00	2.50	3.50	9.00
12 x 7....	5.00	3.25	...	3.00	3.25	5.00	2.00	3.50	9.00
12 x 6....	4.80	3.25	...	3.00	3.25	4.85	2.00	3.50	8.50

A square of slate is 100 sq. ft. as laid on the roof.

Buying has been very satisfactory of late, and, judging from orders booked, prices this year are better than last. In fact, there is talk of a further advance as stocks, especially of roofing slate, are the smallest carried by quarries in some time. Prompt dispatch is interfered with as railroad cars are scarce. On the whole the trade is in a healthy condition.

Export business is not taking any very large quantity of slate just now, as supplies for this purpose are limited. Orders that have been filled during recent months are understood to have realized remunerative prices, as freight rates have been easier than last year.

Liverpool Nov. 6.

(*Special Report of Joseph P. Brunner & Co.*)

Since our last report business in heavy chemicals has slackened off, but quotations are steadily maintained.

Soda ash is in request at usual varying prices as to market. Nearest spot range for tierces is about as follows: Leblanc ash, 48 per cent, £5 15s.@£6; 58 per cent, £6 2s. 6d.@£6 7s. 6d.; per ton, net cash; ammonia ash, 48 per cent, £4 10s.@£4 15s.; 58 per cent, £4 15s.@£5 per ton, net cash; bags 5s. per ton under price for tierces. Soda crystals move off fairly well at generally £3 7s. 6d. per ton, less 5 per cent for barrels, or 7s. less for bags, with special terms for certain export markets. Caustic soda is rather quiet at the moment, but quotations are unchanged, as follows: 60 per cent, £9@£9 5s.; 70 per cent, £10@£10 5s.; 74 per cent, £10 10s.; 76 per cent, £10 15s.@£11 per ton net cash. Bleaching powder is less active, but the recent demand having reduced stocks considerably, holders are firm at £7 per ton net cash for hardwood packages, with special terms for certain export quarters. Chlorate of potash is quoted at 2 7-8@3d. per lb., but buyers are pretty well filled up and there is not much fresh business reported. Bicarb. soda is moving off quietly at £6 15s. per ton, less 2 1-2 per cent for the finest quality in 1 cwt. kegs, with usual allowances for larger packages, also special terms for a few favored markets. Sulphate of ammonia keeps steady at £11 2s. 6d.@£11 5s. per ton, less 2 1-2 per cent for good gray, 24@25 per cent in double bags f. o. b. here, but only a moderate trade is passing. Nitrate of soda is firmly held on spot at £9 10s.@£9 12s. 6d. per ton, less 2 1-2 per cent for double bags f. o. b. here, as to quantity and quality.

IRON MARKET REVIEW.

New York, Nov. 15.

Pig Iron Production and Furnaces in Blast.

Fuel used.	Week ending Nov. 16, 1900. F'ces.	Tons.	Nov. 15, 1901. F'ces.	Tons.	From Jan., '00. Tons.	From Jan.,'01. Tons.
Anth and coke	171	207,950	237	313,925	12,025,087	13,431,724
Charcoal	30	8,150	22	7,150	337,045	351,605
Total	201	216,100	259	321,075	12,362,132	13,783,329

The trade continues extremely active, and large sales of raw materials are reported by our local correspondents, especially in the Pitsburg District. The pressure for billets is so great that some further sales of German material are reported. In finished steel there has been continued inquiry for structural material, and some large orders for steel rails.

While prices for pig iron are a little higher in several grades, especially for near-by deliveries, there have been no material changes in finished material. Some talk of increases has been current, but the leading interest seems to be opposed to any such changes. Its policy is apparently not to check consumption by raising quotations, but to maintain a uniform level as nearly as possible. There can be little question that this is the judicious course, and that steady demand is preferable to a temporary increase of profits.

The production of pig iron, based on the November reports of the blast furnaces, is the largest ever reported and is on a scale of nearly 17,000,000 tons a year. A slight check is caused by the short car supply, several furnaces having been compelled to bank their fires on account of short coke supply. This is only temporary, however. While production is so great, the stocks of iron are not increasing. The *Iron Age* reports show that these stocks on November 1 were only 273,251 tons, being 88,342 tons less than on October 1 and 134,472 tons less than on June 1.

Birmingham. Nov. 11.

(*From Our Special Correspondent.*)

The scarcity of cars has delayed shipments of iron and steel in this district. There is a greater demand for cars than can be met. All raw material is being handled promptly, the cars not being taken from home, but for shipments to other points it is a difficult matter to get the cars.

The prices for pig iron in this district are steady, and during the past week announcement was made that an advance of 25c. was being secured for gray forge. None of the other grades were touched. The investigation of the books in the sales department of the Tennessee Coal, Iron and Railway Company and the Sloss-Sheffield Steel and Iron Company last week showed that the average price was over $10. An advance of 2 1-2c. per ton was granted the miners for their labor, and the iron selling price with the Tennessee Company was only a few cents lower than necessary to warrant a 5c. advance for the miners.

The following quotations are given: No. 1 foundry, $11.50@$12; No. 2 foundry, $11; No. 3 foundry, $10.50; No. 4 foundry, $9.75; gray forge, $9.50@$9.75; No. 1 soft, $11.50@$12; No. 2 soft, $11.

There is continued activity in the finished iron and steel trade. The rolling mills are as busy as they can be and a large number of men are finding employment. The production of steel has been off some in the past 2 weeks, the plant at Ensley not manufacturing much steel, and one of the little furnaces of the steel mill belonging to the Republic Iron & Steel Company at the Birmingham rolling mills being off for a couple of weeks. The steel wire, rod and nail mill at Ensley is working hard. So far nothing in the way of actual construction has been started on the enlargement of the plant. There have been no steps taken on the new steel hoop or the steel plate mill to be erected by the Tennessee Company at Ensley.

Over 100 men went out on a strike during the past week at the Soil Pipe Company's establishment in this city, but the plant was not shut down. The men complain against the rule of deducting $1 from married men and 75c. from single men for a doctor every month. The company asserts that it will not give in, and the men say they can remain out. The plant resumes work this week short handed.

Buffalo. Nov. 13.

(Special Report of Rogers, Brown & Co.)

The most interesting feature of the past week has been the heavy buying of foundry iron by consumers in the district tributary to this market; probably as large a tonnage has been placed as during any week of the past year. These sales added to the engagements previously entered, have practically taken the local furnaces out of the market for the first half of next year. The principal local producer has sold all that its furnaces can make up to next April and booked quite a little tonnage running through to December, 1902. Under these conditions prices have recently advanced through the successive steps of stiffening, asking and getting a total of 50c. per ton. A wise conservatism pervades the trade and while conditions are as favorable for sensational advances as they were at the beginning of the last crazy boom the temper of sellers is against any material changes in prices. We quote below on the cash basis, f. o. b. cars, Buffalo: No. 1 strong foundry coke iron, Lake Superior ore, $16; No. 2, $15.50; Southern soft No. 1, $16.25; No. 2, $15.75; Lake Superior charcoal, $18.25; coke, malleable, $16.

Cleveland. Nov. 13.

(From Our Special Correspondent.)

Iron Ore.—A statement has been compiled of the ore which was shipped away from the ports in the upper lake region during the month of October which shows a total of 2,986,468 tons, which in comparison with 2,402,887 for the same month of the preceding year shows an increase for this season of 583,581 tons. The total movement from the opening of navigation to November 1 was 18,143,573 tons, which, when compared with 17,287,952 tons for the same period a year ago, shows an increase for this season of 855,621 tons. These figures plainly indicate that with but a little more than 1,900,000 tons to move during the month of November and the open season of December to accomplish the feat, it is already assured that the 20,000,000 ton mark in production and transportation will be passed this season. The lake carrying rates remain firm at $1.25 from Duluth and $1.15 from Marquette, with the Escanaba rate in doubt, probably approximating 80c. The prices do not change in the least, holding firm at $4.25 on bessemer and $3 on non-bessemer and Mesabi.

Pig Iron.—Pig iron prices have climbed during the week until No. 2 foundry is now quoted at $14.50 in the Valley and the material is hard to obtain at that because the supply has been entirely sold up for the remainder of the year and contracts have been taken which require deliveries through the first half of next year. Southern foundry No. 2 has also been marked up to $11.25 Birmingham, with a prospect of another increase during the week to $11.50. Basic is very hard to obtain now because of the number of furnaces there are out of blast due to a lack of coke. The price has advanced to $15 in the Valley. Bessemer is being quoted up a little because the supply for immediate shipment is exhausted and the larger buyers are not disposed to enter contracts as yet that entail deliveries after the first of the year. The prices now range between $15.25 and $15.50 in the Valley, with the latter more nearly the quotation.

Finished Material.—A sale of 7,000 tons of steel rails for a Southwestern railroad is one of the possibilities of the market this week because an inquiry for that amount of material has been received and is expected to be closed at once. The rail trade, therefore, lacks nothing of interest. The price holds at $28. Bar iron had dropped down to 1.50c. Pittsburg, due to a determination to readjust the prices giving the proper differentials between bar iron and bar steel. The difference in the quotation is due to the change of base from Youngstown to Pittsburg by which the price was recently inadvertently increased $1 a ton. Bars are in good demand, but it is evident now that the production is in excess of the sales and the mills are looking about for business. Structural material is one of the features of the market and the demand has been so heavy that already contracts for next year's output are being made on the basis of present prices, 1.70c. The market now shows that angles and certain sizes of beams and channels are not to be had much before January. The plate market has taken on an unusual activity, one that was hardly expected to develop. It is now said that sales are being made in excess of production. Billets are off of the market, as are also sheet bars, and the price makes no difference whatever. The sales have been too heavy for the supply. Sheets are in good demand at old prices.

Philadelphia. Nov. 14.

(From Our Special Correspondent.)

Pig Iron.—The market is without additional features. Our brokers report less selling during the week, but say their customers are, as a rule, sufficiently protected. There is talk of iron having sold at an advance of 50c. per ton over recent quotations. It is very certain that if buyers wanted iron on 30 days delivery of recognized brands that they would either pay 50c. more or go without, but a number of sales have been made during the week at which former quotations were accepted. Basic pig is very high and strong.

Steel Billets.—The market has been rather unexpectedly strengthened since Monday. The car shortage is threatening some inconvenience to our Eastern Pennsylvania iron interests.

Merchant Steel.—The larger consumers of merchant steel are again in the market, particularly those who need steel for hardware. The stuff that goes into wagon and carriage shops, and into a great many machine shops is selling very well.

Plate Iron.—In view of of the pending combination of plate interests, local agents have little to say. The volume of business has been light.

Scrap Iron.—The rebellion of buyers who are out with their tomahawks after holders, is not going to amount to anything. There are too many buyers and too little scrap. Even the cheaper grades are held slightly higher this week, choice railroad and heavy steel scrap and axles or car wheels are not to be had.

Pittsburg. Nov. 13

(From Our Special Correspondent.)

The relief promised by the railroads has not materialized and conditions this week are worse than at any time since the shortage of cars first began to affect the iron and steel markets. Many more furnaces have been banked on account of a lack of coke, but none has remained idle more than a few days. It is not possible to give the exact amount of pig iron production lost by the closing temporarily of furnaces, as some with a large capacity were started again as soon as fuel could be obtained. It is estimated that from five to six furnaces in the Mahoning and Shenango Valleys were closed every day for the past 10 days. Some were not shut down more than two days and others were closed for a longer period, but at no time during the past week were more than 15 furnaces banked on the same day. The curtailment of the pig iron supply has not resulted so far in the closing of any of the iron and steel plants, but some may be forced to suspend soon unless conditions are improved.

One of the features of the markets this week is in bessemer pig iron. Some sales have been made at higher prices than have ruled for many months, as shown below. Gray forge prices are firm and foundry iron has advanced 50c. a ton. Several thousand tons were sold.

The demand for structural material is somewhat stronger and a large number of new orders have been placed. It seems impossible to keep up with the demand for sheets and the American Sheet Steel Company and the independent producers are farther behind in deliveries than they were a week ago. It is impossible to keep up with the demand. The principal difficulty is in securing steel.

The bi-monthly adjustment of wages in the union mills being operated under the scale of the Amalgamated Association of Iron, Steel and Tin Workers will occur during the week. There will not be any change in the wages of the tin plate workers, as the price of the tin plate combination remains at $4 a box, which is under the base of the scale. The sheet workers' wages may also be continued, but there is a possibility of an increase owing to the good prices received during the past 60 days. An advance is also probable on the iron scale, as better prices for bar iron were obtained during the past two months than at any time this year.

Pig Iron.—The United States Steel Corporation has contracted for 40,000 tons of bessemer pig iron for delivery in December at $15.25, Valley furnaces. From 6,000 to 7,000 tons were sold at prices ranging up to $15.60, Valley. Gray forge was firm at $14.50@$14.75, Pittsburg, and about 2,500 tons were sold. Foundry No. 2 has advanced to $15.25@$15.50, Pittsburg, an advance of 50c. a ton and several thousand tons were sold.

Steel.—Bessemer steel billets continue scarce and the price is quoted at $28. Several small sales were made at that price. No business for next year was taken during the week. Steel bars are not quite so strong this week, but the price remains at 1.50c. Plates continue firm at 1.60c.

Sheets.—The American Sheet Steel Company and independent producers seem to be farther behind in deliveries than a week ago. It is impossible to keep up with the demand. The price of No. 28 gauge for December delivery is 3.35c. Galvanized sheets are 70 and 10 per cent off and 65 and 5 per cent off for spot delivery.

Ferro-manganese.—Domestic 80 per cent for delivery next year is still quoted at $53.50 and the foreign product is being sold at $50.

New York. Nov. 15.

Pig Iron.—The market is strong and advancing. Owing to the fluctuations on prices quotations at present are nominal. Northern irons can scarcely be had at current quotations for prompt delivery, and Southern irons are expected to advance. We quote for tidewater delivery: No. 1X foundry, $15.75@$16.25; No. 2X, $15@$15.50; No. 2 plain, $14.25@$14.65; gray forge, $14@$14.50. For Southern iron on dock, New York, No. 1 foundry, $15.50@$15.75; No. 2, $14.75@$15; No. 3, $14.25@$14.50; No. 4, $13.75@$14; No. 1 soft, $15.50@$15.75; No. 2, $14.50@$14.75.

Bar Iron and Steel.—Consumption continues very heavy. We quote 1.53c. for common bars in large lots on dock; refined bars, 1.63c.; soft steel bars, 1.65c.

Plates.—Demand is good. Nothing official has been given out about the pending consolidation of 4 Eastern mills. The combine will act in harmony with the United States Steel Corporation regarding prices, but is not under direct control. Eastern mills quote for tidewater delivery in carloads: Tank, 1-4in. and heavier, 1.78c.; flange, 1.88c.; marine, 1.98c.; universals, 1.78c.

Steel Rails and Rail Fastenings.—More orders for next year have been placed by the railroads. Standard sections are still quoted at $28 at Eastern mills; light rails at $28@$30, according to weight. Spikes are 1.80c.; splice bars, 1.55c.; bolts, 2.60@2.70c.

Structural Material.—Buying remains active and a good tonnage has been ordered for next year. We quote four large lots at tidewater as follows: Beams, 1.75c.; channels, 1.75c.; tees, 1.80c.; angles, 1.75c.

METAL MARKET.

New York. Nov. 15

GOLD AND SILVER.

Gold and Silver Exports and Imports.

At All United States Ports in October and Year.

Metal	October. 1900.	October. 1901.	Year. 1900.	Year. 1901.
Gold.				
Exports....	$441,962	$3,808,543	$53,046,883	$36,489,012
Imports....	10,731,375	5,493,864	50,720,485	40,893,906
Excess.....	I. $10,289,413	I. $1,685,421	E. $2,326,398	I. $4,404,894
Silver.				
Exports....	$6,103,354	$4,737,689	$53,605,245	$26,225,618
Imports....	3,031,804	3,070,516	33,302,234	25,551,660
Excess.....	E. $3,071,550	E. $1,667,573	E. $20,303,011	E. $663,958

These figures include the exports and imports at all United States ports, and are furnished by the Bureau of Statistics of the Treasury Department.

Gold and Silver Exports and Imports, New York.

For the week ending Nov. 14, 1901, and for years from January 1st, 1901, 1900, 1899 and 1898.

Period.	Gold. Exports.	Gold. Imports.	Silver. Exports.	Silver. Imports.	Total Excess Exports or Imports.
Week ...	$4,602,723	$94,042	$616,100	$19,074	E. $5,105,707
1901.....	33,588,770	4,419,698	27,145,821	3,299,351	E. 53,015,542
1900.....	36,647,103	10,059,314	34,786,193	4,322,426	E. 14,381,740
1899.....	11,648,849	13,667,526	25,519,132	3,298,194	E. 20,202,161
1898.....	7,439,729	95,709,724	29,731,104	2,725,831	I. 61,264,722

FINANCIAL NOTES OF THE WEEK.

Business continues active and there has been no special incident during the week. Money is in demand and rates are somewhat higher. Exports of gold to France continue, about $3,000,000 having been taken for shipment by Wednesday's steamers from New York. There is a special demand just now for gold in Paris, in view of the placing of a new government loan. French bankers are accordingly calling in loans placed in New York some time ago, which are now maturing. Some sales of our securities are also being paid for in this way—and possibly also some American purchases of Rio Tinto shares, if current reports are true.

Receipts of gold from Australia at San Francisco for the current year up to November 4 amounted to $11,454,553. During the entire year 1900 these receipts were $17,104,364. It is understood that further shipments are on the way.

The receipt of $550,000 in gold yens from Japan is reported at San Francisco. These coins went to the San Francisco Mint for recoinage into United States money. Added to the Australian receipts this makes a considerable amount of gold imported through San Francisco this year.

The statement of the United States Treasury on Wednesday, November 13, shows balances in excess of outstanding certificates as below, compared with the corresponding day last week:

	Nov. 6.	Nov. 13.		Changes.
Gold.	$109,136,510	$110,594,005	I.	$1,457,495
Silver.	12,354,251	11,358,622	D.	995,629
Legal tenders.	8,281,141	7,683,928	D.	597,213
Treas. Notes, etc.	21,001	56,702	I.	35,701
Totals.	$129,792,903	$129,693,257	D.	$99,646

Treasury deposits with national banks amounted to

$114,752,646, showing an increase of $5,560 over last week.

The statement of the New York banks, including the 63 banks represented in the Clearing House—for the week ending November 9—gives the following totals, comparison being made with the corresponding weeks in 1900 and 1899:

	1899.	1900.	1901.
Loans and discounts	$688,385,000	$785,656,500	$886,995,000
Deposits	744,801,000	831,091,800	950,419,100
Circulation	16,366,400	30,705,700	31,821,400
Specie	137,074,100	156,256,700	177,339,200
Legal tenders	46,337,200	56,122,300	68,955,500
Total reserve	$183,411,300	$212,379,000	$246,294,700
Legal requirements	186,200,250	207,772,950	237,604,775
Balance surplus	*$2,788,950	$4,606,050	$8,689,925

*Deficit.

The following table shows the specie holdings of the leading banks of the world at the latest dates covered by their reports. The amounts, are reduced to dollars and comparison is made with the holdings at the corresponding date last year.

	1901. Gold.	1901. Silver.	1901. Gold.	1901. Silver.
N. Y. Ass'd	$156,256,700	.....	$177,339,200	.....
England	158,650,755	.....	175,918,250	.....
France	460,046,335	$222,718,055	476,039,825	$219,669,420
Germany	125,510,000	64,655,000	147,865,000	76,170,000
Spain	68,755,000	83,230,000	70,035,000	84,975,000
Netherlands	24,350,000	28,200,000	28,778,000	28,840,000
Belgium	13,865,000	6,930,000	14,970,000	7,485,000
Italy	77,080,000	8,380,000	79,665,000	9,849,500
Russia	353,555,000	30,290,000	335,070,000	29,405,000

The returns of the Associated Banks of New York are of date November 9 and the others November 7, as reported by the *Commercial and Financial Chronicle* cable. The New York banks do not report silver separately, but the specie carried is chiefly gold. The Bank of England reports gold only.

The statement of the foreign trade of the United States prepared by the Bureau of Statistics of the Treasury Department shows the following figures for the 10 months ending October 31:

	1900.	1901.
Exports	$1,195,353,918	$1,191,960,322
Imports	695,038,467	727,897,358
Excess, imports	$500,255,451	$464,062,964
Add excess of exports, silver		663,958
Total		$464,726,922
Deduct excess of imports, gold		4,404,894
Apparent balance of exports		$460,322,028

The gold and silver movement in detail will be found in the usual place, at the head of this column.

Exports of specie from San Francisco by water for the 10 months ending October 31 are reported as follows:

	Gold	Silver	Totals
U. S. Coin	$1,417,804	$187,661	$1,605,465
Mexican Dollar	.....	4,321,147	4,321,147
S. Am. Coin	.....	17,165	17,165
Bullion	222,185	3,753,686	3,975,871
Totals	$1,639,989	$8,279,659	$9,919,648
Totals, 1900	3,926,205	13,185,569	17,111,774

The Mexican dollars shipped in 1900 amounted to $8,954,146. The falling off in silver was in shipments to New York. The shipments this year were divided as follows: China, $7,913,418; Japan, $2,280; India, $30,000; Pacific Islands, $5,920; Central America, $720; Mexico, $100,000; New York, $1,868,210.

The silver market continues to be a gradually sagging one, due largely to dear money on the other side. The London demand is very restricted, and there are only intermittent buyers for the far East.

The United States Assay Office, in New York, reports the receipt of 33,000 oz. silver during the week.

Shipments of silver from London to the East for the year up to October 31, are reported by Messrs. Pixley & Abell's circular as follows:

	1900	1901	Changes
India	£5,241,772	£6,427,910	I. £1,186,138
China	1,110,814	590,212	D. 520,602
The Straits	554,794	402,821	D. 151,973
Totals	£6,907,380	£7,420,943	I. £513,563

Arrivals for the week this year were £90,000 in bar silver from New York, £16,000 from the West Indies, and £3,000 from Australia; total £109,000. Shipments were £160,000 in bar silver to Bombay, £22,677 to Hongkong, and £10,000 to Calcutta; total, £192,677. Also £52,580 in Mexican dollars to Hongkong, £19,600 to Shanghai, £11,860 to Singapore, and £10,070 to Manila; total, £94,110.

Indian exchange is strong, in view of larger exports and a continued demand for money in Bombay and Calcutta. The Council bills offered in London were all taken at 16d. per rupee, with a demand in excess of the offerings. Takings of silver for India, however, continue very light.

OTHER METALS.

Daily Prices of Metals in New York.

November.	Silver—Sterling Exchange	Silver—N. Y. Cts.	Silver—London Pence.	Copper—Lake Cts. per lb.	Copper—Electrolytic per lb.	Copper—London £ per ton.	Tin, cts. per lb.	Spelter—Lead cts. per lb.	Spelter—N.Y. cts. per lb.	Spelter—St. L. cts. per lb.
8	4.87	57⅞	26 7/16	16⅝@16¾	16¼	65½	24⅝	4.32½@4.37½	4.27½	.12¼
9	4.87	57⅞	....	16⅝@16¾	16¼	....	24⅝	4.32½@4.37½	4.27½	4.12½
11	4.87	57⅛	26⅜	16⅝@16¾	16¼	65¼	24¾	4.32½@4.37½	4.27½	4.12½
12	4.87¼	57¼	26⅜	16⅝@16¾	16¼	65¼	25	4.32½@4.37½	4.27½@4.30	4.12½@4.15
13	4.87¼	57⅛	26 7/16	16⅝@16¾	16¼	66	25⅛	4.32½@4.37½	4.27½@4.30	4.12½@4.15
14	4.87	56⅞	26 5/16	16⅝@16¾	16¼	66⅜	25⅞	4.32½@4.37½	4.27½@4.30	4.12½@4.15

London quotations are per long ton, (2,240 lbs.) standard copper, which is now the equivalent of the former g. m. b's. The New York quotations for electrolytic copper are for cakes, ingots or wirebars; the price of electrolytic cathodes, is usually 0.25c lower than these figures.

Copper.—In the absence of any official confirmation of the many rumors circulated of late regarding a reduction in the price, a curtailment in the production, etc., the market continued to rule quiet and steady without any special feature. The disposition on the part of consumers seems to be to operate somewhat more freely, and we learn of some inquiries for forward delivery. A cut in the price of copper wire has been reported. Quotations are unchanged at 16⅝@16¾c., for Lake; 16¼c. for electrolytic copper in cakes, wire bars and ingots, 16c. for cathodes; 15⅞@16c. for casting copper.

There has been a better demand from Europe, but exports do not as yet show up well.

The market for standard copper in London, which closed last Thursday at £65.10s., opened very strong on Monday at £65.15s., and has further advanced in the course of the week, the closing quotations on Thursday being cabled as £66 5s.@£66 7s. 6d. for spot, £65@£65 2s. 6d. for three months.

Inasmuch as quite heavy quantities of Chile bars have been withdrawn for consumption, short sales on the London Exchange are considered rather dangerous, as the available supply is limited; hence the higher foreign market.

Refined and manufactured sorts we quote: English tough, £71 15s.@£72; best selected, £72 10s.@£72 15s.; strong sheets, £80 5s.@80 10s.; India sheets, £77@£77 5s.; yellow metal, 6 5-8@6 3-4 d.

Exports of copper from New York, Philadelphia and Baltimore for the week ending November 13, are reported by our special correspondents as follows: To England, 130 tons; France, 375; Germany, 159; Holland, 283; Austria, 10; total, 957 tons. Also 678 tons matte to England.

Imports were 525 tons copper, and 150 tons matte.

Tin.—The lethargy which prevailed for some time past, has given way to considerable activity. It seems that of late consumption has been very good, and this, accompanied by the fact that comparatively small quantities of tin are in sight for the next few weeks, caused a sudden spurt. While towards the end of last week, spot tin could be secured for 24⅝, prices have advanced by leaps and bounds until 25¾ was bid on Thursday being cabled as £66 5s.@£66 7s. for spot, quoted at 25¼@25⅜c.

The foreign market has not as yet been affected by the movement on this side. It closed last week at £113 12s. 8d., declined on Monday to £112, and the closing quotations on Thursday are cabled as £112@£112 2s. 6d. for spot, £107 12s. 6d.@£107 15s. for three months.

Lead.—There is a good demand for this metal, but quotations are unchanged at $4.25@$4.32 1-2 St. Louis, $4.32 1-2@$4.37 1-2 New York.

The foreign market is flat, Spanish lead being quoted at £11 2s. 6d.@£11 3s. 9d., English lead 2s. 6d. higher.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead is very quiet. Missouri metal is selling for 4.27½c., and desilverized lead at 4.32½c. Trading is of a retail character only.

Spelter.—Continues to display considerable strength. Owing to an advancing ore market, producers generally have withdrawn from the market. On the other hand, there is a good inquiry on the part of consumers for delivery into next year. The ruling quotations are 4.12 1-2@4.15c. St. Louis, 4.27 1-2@4.30c. New York.

The foreign market is steady, good ordinaries being quoted at £16 12s. 6d., specials 5d. higher.

The probabilities are that the reported convention of the foreign producers will go through.

St. Louis Spelter Market.—The John Wahl Commission Company telegraphs us as follows: Spelter is dull and a little easier. The latest sales are on the basis of 4.07½c East St. Louis, and at this price there are not very many buyers in the market.

Silesian Spelter Market.—Herr Paul Speier writes from Breslau under date of October 30 that the proposed agreement among the zinc producers is the chief topic of discussion, but nothing is as yet settled. The business has been fair, and quotations are 33.50@34.50 marks per 100 Kgs. f. o. b. Breslau. This is an average of 3.67c. per pound. Imports and exports in Germany for the nine months ending September 30 were, in metric tons:

	Imports. 1900.	Imports. 1901.	Exports. 1900.	Exports. 1901.
Spelter bars	35,441	30,135	73,094	74,895
Zinc sheets	235	340	24,902	23,146
Scrap zinc	2,358	1,668	2,087	1,702
Zinc ore	104,554	121,488	54,631	59,066
Zinc, white	7,541	5,835	22,199	23,717
Lithopone	25	35	8,456	10,195

The largest takers of spelter this year were: Austria-Hungary, 21,904 tons; Great Britain, 22,976 tons; Russia, 16,612 tons.

Antimony.—Is unchanged, Cookson's being quoted at 10c.; Halletts, 8 3-8; Hungarian, Italian, Japanese and United States Star at 8@8 1-4c.

Nickel.—The price continues firm at 50@60c. per lb. according to size and terms of order.

Platinum.—Consumption continues good and prices are strong. Ingot platinum in large lots brings $20@$21 per oz. in New York. In London prices are about on a parity with the New York rate.

Chemical ware (crucibles and dishes), best hammered metal from store in large quantities, is worth 82c. per gram.

Quicksilver.—The nominal quotation in New York continues $51 per flask, but the metal can still be had for somewhat less, $49.50 for large orders. In San Francisco the quotations are $47@$48 per flask for domestic trade, and $43@$44 for export. The London quotation is £9 per flask, with the same price quoted from second hands.

Minor Metals and Alloys.—Wholesale prices, f. o. b. works, are as follows:

Aluminum.	Per lb.		Per lb.
No. 1, 99% ingots	33@37c.	Ferro-Tungsten (37%)	28c.
No. 2, 90% ingots	31@34c.	Magnesium	$2.75@$3
Rolled sheets	42c. up	Manganese (over 90%)	$1.00
Alum.-brone	20@23c.	Mangan'e Cop. (20% Mn)	32c.
Nickel-alum	33@39c.	Mangan'e Cop. (30% Mn)	38c.
Bismuth	$1.50	Molybdenum (Best)	$1.82
Chromium (over 90%)	1.00	Phosphorus	50c.
Copper, red oxide	50c.	American	70c.
Ferro-Molyb'um (50%)	$1.25	Sodium metal	50c.
Ferro-Titanium (10%)	90c.	Tungsten (Best)	62c.
Ferro Titanium (20%.)	$1.10		

Variations in prices depend chiefly on the size of the order.

LATE NEWS.

A decision of importance to manufacturers and users of concentrating machinery was given on November 5 at Denver, Col., when Judge Riner, of the United States Court, District of Colorado, decided the suit between A. R. Wilfley and the Denver Engineering Works Company. The manufacturers of the Wilfley table had entered suit for infringement against the Denver Engineering Works Company, who are the manufacturers of the Cammett table. By the decision of Judge Riner the claims of the Wilfley patent have been upheld and a sweeping decision was given, confirming to Mr. Wilfley the use of all strips or riffles of whatever nature on concentrating tables. In the decision damages were awarded to the Wilfley concentrating table and an injunction was issued against the further manufacture of the Cammett table by the Denver Engineering Works Company. As a large number of companies have entered upon the manufacture of tables very similar to the Wilfley concentrating table, it is very probable that a number of them will be compelled to discontinue business, as suits have been entered against a number of these manufacturers by the manufacturers of the Wilfley table.

COLORADO.

TELLER COUNTY—CRIPPLE CREEK.

(From Our Special Correspondent.)

Calhoun Gold Mining Company.—The Victor Consolidated No. 1, Victor Consolidated No. 2 and the Ithica tunnel and tunnel site have been transferred to the Ajax Company. The property is situated on Battle Mountain and adjoins the Ajax. For a number of years the companies were in litigation over the rights of tunnel sites and the rights of cross veins. The claims transferred were only fractions.

Acacia Gold Mining Company.—The annual meeting will be held in December. It is not expected that there will be any change in the directorate as there has been no great change in the ownership of the stock. The Burns claim is worked by 3 sets of lessees: The Monarch Mining and Development Company, on the old Brady lease and McFarland and Owenby on the old Wrockloff lease. Dan Falve has also a lease on a portion of the old Brady lease. All the lessees are shipping some ore.

STOCK QUOTATIONS.

Prices of Foreign Coins.

	Bid.	Asked.
Mexican dollars	$.45¼	$.47⅛
Peruvian soles and Chilean pesos	.42	.45
Victoria sovereigns	4.85	4.88
Twenty francs	3.84	3.88
Twenty marks	4.73	4.85
Spanish 25 pesetas	4.78	4.82

Average Prices of Metals per lb., New York.

Month.	—Copper.— 1901.	1900.	—Tin.— 1901.	1900.	—Lead.— 1901.	1900.	Spelter.— 1901.	1900.
Jan.	16.25	15.58	26.51	27.07	4.35	4.68	4.13	4.65
Feb.	16.38	15.78	26.68	30.58	4.35	4.675	4.01	4.64
March	16.42	16.29	26.03	32.90	4.35	4.675	3.91	4.60
April	16.43	16.76	25.93	30.90	4.35	4.675	3.98	4.71
May	16.41	16.34	27.12	29.37	4.35	4.181	4.04	4.53
June	16.38	15.75	28.60	30.50	4.35	3.901	3.99	4.29
July	16.31	15.97	27.85	33.10	4.35	4.030	3.95	4.28
August	16.25	16.35	26.78	31.28	4.35	4.250	3.99	4.17
Sept.	16.25	16.44	25.31	29.42	4.35	4.350	4.08	4.11
October	16.25	16.37	26.62	28.54	4.35	4,350	4.23	4.15
Nov.	....	16.40	....	28.25	...	4.350	...	4.29
Dec.	....	16.31	....	28.94	...	4.350	...	4.25
Year	....	16.19	....	29.90	...	4.37	...	4.39

The prices given in the table for copper are the averages for electrolytic copper. The average price for Lake copper for the year 1900 was 16.52c.; for the month of January, 1901, it was 16.77c.; for February, 16.90c; for March, 16.94c.; for April, 16.94c.; for May, 16.94c.; for June, 16.90c.; for July, 16.61c.; for August, 16.50c.; for September, 16.54c.; for October, 16.60c.

Average Prices of Silver, per oz., Troy.

Month.	1901. London. Pence.	1901. N. Y. Cents.	1900. London Pence.	1900. N. Y. Cents.	1899. London. Pence.	1899. N. Y. Cents.
January	28.97	62.82	27.30	59.30	27.42	59.36
February	28.13	61.06	27.49	59.76	27.44	59.42
March	27.04	60.63	27.59	59.81	27.48	59.64
April	27.30	59.29	27.41	59.59	27.63	60.10
May	27.43	59.64	27.56	59.96	28.15	61.23
June	27.42	59.57	27.81	60.42	27.77	60.43
July	26.96	58.46	28.23	61.25	27.71	60.26
August	26.94	58.37	28.13	61.14	27.62	60.00
September	26.95	58.26	28.85	62.63	27.15	58.89
October	26.62	57.59	29.58	63.83	26.70	57.98
November	....	....	29.66	64.04	27.02	58.67
December	....	....	29.68	64.14	27.21	58.99
Year	....	....	28.27	61.33	27.44	59.58

The New York prices are per fine ounce; the London quotation is per standard ounce, .925 fine.

UNITED STATES.

Articles. Long tons.	September. Imports.	September. Exports.	Nine months. Imports.	Nine months. Exports. Foreign.	Nine months. Exports. Domestic.
Ores and Metals.					
Antimony	181	...	1,354	...	...
Antimony ore	8	....	722	22	...
Copper	3,421	6,119	25,103	4,692	65,643
Copper ore, matte	9,038	1,975	66,046	7,788	10,673
Iron and Steel:					
Bars, rods	2,394	2,696	27,027	61	41,943
Billets, blooms	518	50	5,752	2	27,103
Hoops, bands	885	5	1,688	...	1,014
Pig iron	5,684	2,170	33,965	135	48,956
Nails and spikes	...	2,598	...	...	24,785
Rails	19	17,648	890	...	267,535
Scrap	2,082	1,153	15,002	3,331	10,672
Sheets, plates	606	732	3,593	81	26,989
Wire	122	7,831	2,384	27	61,525
Miscellaneous	39	4,709	321	13	40,932
Iron ore	115,618	11,435	724,676	...	49,401
Lead	10	1	129	22	2,109
Lead ore, bullion	5,079	7,146	76,797	69,503	...
Manganese ore, oxide	11,469	4	111,834	106	...
Nickel ore, matte	5	266	27,951	...	1,987
Quicksilver	...	33	...	...	264
Tin	2,697	49	25,405	828	...
Tin & black plates	8,515	28	50,644	125	416
Zinc	...	154	329	...	2,402
Zinc ore	...	2,188	...	...	29,286
Minerals.					
Asphalt	12,264	...	109,851	105	...
Brimstone	13,720	....	119,481	151	...
Cement	17,656	9,401	109,262	5,158	59,092
Coal, anthracite	....	153,192	....	7	1,607,415
Coal, bituminous	152,048	436,742	1,456,073	2,084	4,126,014
Coke	...	31,324	...	...	294,375
Copper sulphate	....	138	...	...	21,019
Graphite	835	...	11,213	3	...
Nitrate of soda	13,092	...	152,518	1,656	...
Phosphate rock	22,098	68,870	118,255	30	576,483
Pyrites	37,296	...	301,548	...	...
Salt	14,413	1,433	134,924	1,469	7,424

The figures for copper are those given by the Treasury Department. The statement made by Mr. John Stanton for the Associated Copper Companies will be found monthly in our metal market. These figures give the exports for September as 6,419; nine months, 68,110 tons.

Import Duties.

Metals.—The duties on metals under the present tariff law are as follows: Antimony, metal or regulus, ¾c. a lb. Lead 1½c. a lb. on lead ores; 2½c. a lb. on pigs, bars, etc., 2½c. on sheet pipe and manufactured forms. Nickels, 6c. a lb. Quicksilver, 7c. a lb. Spelter or zinc, 1½c. a lb. on pigs and bars, 2c. on sheets, etc. Copper, tin and platinum are free of duty.

Minerals.—Duties are: Asphalt, crude, $1.50 per ton, and refined $3 per ton. Coal, bituminous, 67c. long ton; coke, 20 ad. val. Cement, Roman Portland and hydraulic, in bulk, 8c. per 100 lbs. and in packages 7c. Copper sulphate, ½c. a lb. Salt in bulk, 8c. per 100 lbs., and in bags, etc., 12c. Brimstone, anthracite coal, graphite, phosphate rock, pyrites and nitrate of soda are free of duty.

NEW YORK

Company and Location.	Par val.	Nov. 7 H.	Nov. 7 L.	Nov. 8 H.	Nov. 8 L.	Nov. 9 H.	Nov. 9 L.	Nov. 11 H.	Nov. 11 L.	Nov. 12 H.	Nov. 12 L.	Nov. 13 H.	Nov. 13 L.	Sales
Alamo Colo.	$1	....	....	....	....	....	....	....	....	....	....	....	....	.....
Alice Mont.	25	....	....	....	....	....	....	....	....	.45	....	....	....	10
Amalgamated c Mont.	100	87.75	85.50	87.38	85.75	86.75	86.00	88.25	85.88	89.00	87.25	87.88	86.38	185,475
Anaconda, c Mont.	25	35.25	34.75	34.63	34.00	34.50	34.13	35.50	34.50	35.50	35.00	35.25	35.00	12.00
Anaconda Gold Colo.	5	.28	....	....	....	....	....	.26	....	....	....	.25	....	.....
Argentum J. Colo.	2	....	....	.10	....	....	....	....	....	....	....	.09	....	2,000
Best & Belcher Nev.	3	....	....	.16	....	....	....	....	....	....	....	.16	....	400
Breece Colo.	25	....	....	....	....	....	....	....	....	....	....	1.25	....	100
Brunswick Cal.	1	....	....	....	....	....	....	....	....	....	....	....	....	.....
Comstock T. Nev.	100	.06	....	....	....	....	....	....	....	.06	....	....	....	900
Comstock Bonds Nev.	100	.06	....	....	....	....	....	....	....	.06	....	....	....	1,000
Con. Cal. & Va	2½	....	....	1.75	....	....	....	1.75	....	1.70	....	....	....	600
Cripple Cr. Con Colo.	1	....	....	....	....	....	....	....	....	.09½	....	....	....	1,000
Deadwood S. Dak.	25	....	....	....	....	....	....	....	....	....	....	....	....	.....
Elkton Colo.	1	....	....	....	....	....	....	....	....	....	....	....	....	.....
Fanny Ramlings Colo.	1	....	....	....	....	.20	....	....	....	....	....	....	....	.....
Hale & Norcross Nev.	3	....	....	.20	....	....	....	....	....	....	....	....	....	100
Horn Silver Utah.	25	....	....	....	....	....	....	....	....	....	....	....	....	
Iron Silver Colo.	20	....	....	....	....	....	....	....	....	....	....	....	....	.....
Isabella Colo.	1	.47	.46	.47	....	.46	....	....	....	.45	....	.63	....	300
Little Chief Colo.	1	....	....	....	....	....	....	....	....	....	....	.40	....	1,000
Mexican Nev.	3	....	....	....	....	....	....	....	....	....	....	....	....	.....
Mollie Gibson Colo.	5	....	....	.22	....	.24	.22	.25	....	....	....	.23	....	1,500
Ontario Utah.	100	10.75	....	10.63	....	....	....	....	....	....	....	10.50	....	160
Ophir Nev.	3	....	....	....	....	.80	....	....	....	.80	....	....	....	200
Pharmacist Colo.	1	....	....	.07½	....	....	....	.08	....	....	....	.07½	....	5,000
Phoenix Ariz.	1	.07	....	.08	....	....	....	.09	.08	.09	....	.09	....	1,200
Quicksilver Cal.	100	....	....	4.25	....	....	....	....	....	....	....	....	....	100
Quicksilver pf. Cal.	100	....	....	....	....	....	....	....	....	....	....	....	....	
Sierra Nevada Nev.	3	....	....	.15	....	....	....	....	....	....	....	....	....	200
Standard Con. Cal.	10	4.00	....	3.95	....	3.95	....	4.00	....	....	....	3.85	....	700
Union Copper N. C.	10	5.00	4.88	5.00	4.88	6.00	5.88	7.25	7.13	7.13	7.00	7.13	7.00	65,000

Coal and Industrial Stocks.

Am. Agr. Chem. U. S.	$100	.23	.22½	.24	.22	.24	.22	.24	.22	.22½	....	.24	.22	620
Am. Agr. Chem pf. U. S.	100	....	....	.83	.82	.82½	.82	.83	.81½	....	....	.83	.81	....
Am. Car & Fdy. U. S.	100	.26½	.26¼	.26½	..	.26¾	.26½	.28½	.27	.28½	.28	.28	.27⅞	11,775
Am. Car & Fdy. pf. U. S.	100	.81⅞	.81¼	.81⅞	..	.82	..	.86	.83	.84½	.84	.83½	—	4,373
Am. Sm. & Ref. U. S.	100	.44¼	.41⅜	.44¼	.43	.43¾	.42¼	.43⅜	..	.46	.43½	.46½	.45⅛	42,425
Am. Sm. & Ref. pf.	100	.97½	.96	.97½	.97¼	....	....	.97½	.97	.98¼	.97	.97¾	.97	6,831
Col. Fuel & I. Colo.	100	.95¼	.94	.95	..	.95	.93	.96	.93½	.94⅞	.94	.94	.93½	5,671
Col. & H. C. & I. Colo.	100	.14	..	.14¼	.14⅛	....	....	.15	....	....	....	.14¾	....	700
Int'l S. Pump U. S.	100	.47	.46	.47	.46	.47	.46	.47¼	.47	.47¼	....	.48	.47	1,000
Int'l S. Pump pf. U. S.	100	.86½	.84½	.85⅞	..	.86	.85¼	.86	.85¼	.87	....	..	..	200
Mong. R. Coal Pa.	100	.13	.12⅞	.13⅛	.12⅞	.13⅛	.13	.13	.12⅞	..	....	..	..	1,120
Mong R. Coal pf. Pa.	100	.46	.45¼	.45¼	..	.46	.45½	.46	.45⅜	....	....	..	..	105
National Lead U. S.	100	.20	.19⅝	.19⅝	..	.19½	..	.19⅞	.19⅜	.19½	....	.19⅛	.19	1,700
National Lead pf. U. S.	100	..	..	..	..	..	..	..	..	..	....	..	..	....
National Salt U. S.	100	..	..	..	..	..	..	..	..	..	....	.42	.32	....
National Salt pf. U. S.	100	.68	..	.63	.62	....	....	....	....	....	....	.69	.63	400
Pittsburg Coal Pa.	100	.27½	.27⅝	.27½	.27¼	.27⅝	.27¼	.27⅝	.27¼	..	....	..	..	1,933
Pittsburg Coal pf. Pa.	100	.92¼	.92	.92¼	.91⅞	.92	.91⅞	.92⅛	.92	....	....	..	..	1,502
*Pressed Steel Car Pa.	100	.42⅞	.42½	.42⅝	.42⅜	.45	.42	.44⅜	.43⅜	.44⅜	.43⅝	.44½	.43½	14,030
Republic I. & S. U. S.	100	.15⅝	.15	.15¼	.15	.15¼	.15	.16¼	.15¼	.16⅜	.15⅞	.16⅜	.15¾	14,645
Republic I. & S pf. U. S.	100	.66⅝	.66	.66⅜	.66⅛	.66⅜	..	.68¼	.66⅞	.69	.68⅛	.69⅝	.69	4,940
Sloss-Shef S. & I. pf. Ala.	100	.31	.29½	..	..	.31	.29½	.31	.30	.31	....	.31	.30½	1,300
Sloss-Shef S. & I. Ala.	100	.80	.77	....	....	.79	.77	.81	.79	.82	.81	....	....	700
Standard Oil U. S.	100	710	704	710	708	710	707	718	715	719	713	7.19	7.13	....
Tenn. C. I. & R. R. Ala.	100	.62½	.61	.62	.61¾	.62¼	.61⅞	.65	.63	.65	.65⅜	.64⅜	.63⅜	32,100
U. S. Steel Corp. U. S.	100	.43½	.42⅜	.43⅜	.43	.43⅞	.43¼	.44½	.44⅛	.44½	.43⅞	.44⅛	.43½	156,280
U. S. Steel Corp. pf. U. S.	100	.93⅛	.92	.92⅞	.92¼	.93⅛	.92¾	.94	.93⅜	.93⅞	.93⅜	.93⅜	.92⅞	125,000
Va.-Car. Chem. U. S.	100	.65	.60½	..	..	.65	.63⅛	.64½	.64	.64	.62½	.64	.63	300
Va.-Car Chem. pf. U. S.	100	1.25	1.21½	1.25	1.22½	1.23	1.22½	1.24	1.23	1.24	1.22½	1.23½	1.22½	300

Total sales, 608,155 shares.

BOSTON, MASS.

Name of Company.	Par. Val.	Shares listed.	Nov. 7. H.	Nov. 7. L.	Nov. 8. H.	Nov. 8. L.	Nov. 9. H.	Nov. 9. L.	Nov. 11. H.	Nov. 11. L.	Nov. 12. H.	Nov. 12. L.	Nov. 13. H.	Nov. 13. L.	Sale.
Adventure Con., c	$25	100,000	23.00	....	22.75	22.50	22.50	....	24.50	22.50	24.50	23.00	24.00	22.50	2,622
Aetna Con., q	5	100,000	....	....	....	....	....	....	....	....	....	....	....	....	.....
Allouez, c	25	80,000	....	....	5.00	....	4.75	4.50	....	....	4.75	....	4.50	....	410
Amalgamated, c	100	1,550,000	87.63	85.25	87.25	85.75	87.00	86.25	88.50	86.25	89.00	87.38	88.00	86.50	21,663
Am. Gold Dreg	5	90,000	....	....	....	....	....	....	....	....	....	....	....	....	.....
Am. Z. L. & Sm.	25	60,000	....	....	....	....	....	....	....	....	....	....	....	....	.....
Anaconda, c	25	1,200,000	....	....	34.38	34.13	....	....	34.50	....	35.50	....	....	....	85
Arcadian, c	25	150,000	5.00	....	5.25	5.00	....	....	6.00	5.25	9.00	6.00	6.50	6.00	6,160
Arnold, c	25	60,000	....	....	....	....	....	....	1.25	....	1.25	....	....	....	200
Ash Bed	25	40,000	.25	....	....	....	....	....	....	....	....	....	....	....	100
Atlantic, c	25	40,000	....	....	37.50	37.00	....	39.00	37.00	39.00	....	....	39.50	37.75	895
Baltic	25	100,000	42.88	41.50	42.00	41.00	43.00	42.50	45.00	42.00	45.00	44.50	44.00	43.50	2,525
Bingham, Cons.	50	150,000	29.00	28.00	29.25	29.00	....	....	29.63	29.00	30.00	29.00	30.00	29.25	3,791
Bonanza Dev.	10	300,000	1.06	....	1.00	....	....	....	1.13	....	1.13	....	....	....	410
Boston, q	10	100,000	....	....	....	....	....	....	....	....	....	....	....	....	.....
Breece	25	200,000	....	....	....	....	....	....	1.25	....	....	....	....	....	200
British Columbia	5	200,000	....	....	....	....	....	....	13.25	....	14.00	13.50	....	....	425
Cal. & Hecla, c	25	100,000	6.55	6.50	6.60	6.50	6.50	....	6.45	....	6.50	6.48	6.50	6.45	166
Catalpa	10	300,000	....	....	....	....	....	....	.18	....	....	....	....	....	1,100
Centennial, c	25	90,000	17.00	15.50	16.75	16.50	16.50	16.25	18.75	16.25	18.50	17.75	17.75	17.00	3,239
Central Oil	25	60,050	....	....	....	....	....	....	....	....	....	....	....	....	40
Cochiti, g	10	193,750	3.75	....	4.00	....	4.00	....	....	....	4.00	....	....	....	3,400
Cons. Mercur, g	5	1,000,000	1.88	....	1.88	....	1.88	....	1.88	1.75	1.75	....	1.75	....	.....
Con. Zinc & L. M. S.	10	110,000	....	....	....	....	....	....	....	....	....	....	....	....	.....
Copper Range, c	25	100,000	60.00	58.50	59.75	59.00	60.00	59.00	63.00	60.00	64.00	62.00	62.00	61.00	3,761
Daly-West	20	150,000	33.50	33.00	33.00	....	....	....	....	....	32.50	32.00	32.00	....	600
Dominion Coal	100	150,000	47.63	46.75	47.50	47.00	47.00	....	47.25	....	47.00	46.50	46.75	....	1,030
Dominion Coal, pf.	100	30,000	....	....	....	....	....	....	1.18	....	....	....	....	....	1
Elm River, c	12	100,000	....	....	3.50	....	3.25	....	3.75	....	4.00	3.75	3.50	....	335
Franklin, c	25	100,000	....	....	16.38	16.00	....	....	17.00	16.50	16.75	....	16.75	....	390
Guanajuato Cons.	5	385,000	7.00	6.25	7.13	6.50	7.13	6.63	7.25	7.00	7.25	6.88	6.75	6.63	12,752
Humboldt, c	25	40,000	....	....	....	....	....	....	....	....	....	....	....	....	.....
I. Royale Con., c	25	150,000	24.00	23.50	24.50	24.25	24.00	....	25.50	24.50	25.50	23.00	24.00	22.50	1,589
Mass. Con., c	25	100,000	24.38	24.00	24.00	....	24.38	24.00	25.00	24.00	25.50	24.00	24.38	23.50	6,601
Mayflower, c	25	100,000	3.88	3.75	....	....	3.75	....	4.25	3.63	4.25	4.00	4.00	3.75	2,730
Michigan, c	25	100,000	13.00	....	13.25	....	13.00	....	13.88	13.00	14.00	13.25	13.75	13.50	1,008
Mohawk, c	25	100,000	41.75	41.13	41.50	....	41.75	41.50	43.50	42.00	43.50	43.25	42.38	42.00	2,840
Mont. C. & C.	25	200,000	4.25	....	4.25	....	4.00	3.50	....	....	....	....	....	....	570
National	25	100,000	2.00	....	....	....	....	....	....	....	....	....	....	....	70
N. E. Gas & Coke	100	100,000	4.75	....	4.50	4.25	4.50	4.25	....	....	4.75	4.50	....	....	265
Old Colony, c	25	100,000	4.00	3.75	....	....	4.00	....	....	....	4.13	3.88	4.00	3.88	850
Old Dominion, c	25	150,000	26.63	25.50	26.00	25.13	26.00	....	26.50	25.38	26.25	25.63	25.25	24.50	3,530
Osceola, c	25	93,000	98.50	97.50	99.75	98.63	98.00	97.25	1.00½	97.50	102.	99.00	99.00	98.25	3,281
Parrot, s c	10	229,850	36.50	35.00	36.63	....	36.75	36.00	37.50	36.00	37.00	....	36.50	....	1,422
Phoenix Con., c	25	100,000	....	....	....	....	....	....	6.00	....	6.00	....	....	....	200
Quincy, c	25	100,000	160.	....	....	....	....	....	157.	155.	160.	155.	....	....	174
Rhode Island, c	25	100,000	....	....	....	....	....	....	....	....	4.00	3.75	4.00	3.50	400
Santa Fe, g. c	10	250,000	4.50	....	....	....	5.00	....	5.00	4.50	5.00	4.88	4.50	4.00	1,043
San Ysabel, g	5	130,000	....	....	....	....	....	....	....	....	....	....	....	....	10
Shawmut Oil	25	50,000	....	....	....	....	....	....	....	....	....	....	....	....	.....
Tamarack, c	25	60,000	2.80	2.79	2.75	2.70	2.65	....	2.95	2.70	....	....	2.73	....	174
Tecumseh, c	25	80,000	....	....	....	....	....	....	....	....	....	....	2.00	....	100
Trimountain, c	25	100,000	40.00	....	....	....	41.00	....	48.50	....	46.00	44.00	44.25	43.00	4,044
Trinity, c	25	160,000	26.13	....	27.00	25.50	....	....	27.75	26.25	27.50	25.75	26.50	26.00	5,305
United States, g	25	250,000	16.00	15.25	16.00	15.50	16.00	15.75	16.50	15.50	16.50	15.50	....	....	2,895
U. S. Oil	25	100,000	....	....	12.50	....	....	....	12.50	....	13.00	....	13.50	13.00	613
Utah Con., g	5	300,000	24.00	23.50	24.88	24.38	25.00	24.00	24.75	24.00	24.50	24.00	24.50	24.00	5,471
Victoria, g	25	100,000	7.25	....	7.50	7.00	7.00	....	7.25	6.75	7.50	7.13	....	....	1,790
Washington, c	25	60,000	....	....	....	....	....	....	....	....	....	....	....	....	.....
Winona, c	25	100,000	2.00	....	2.13	....	2.25	2.13	2.13	....	2.13	....	....	....	670
Wolverine, c	25	60,000	57.00	....	....	....	57.00	....	58.50	58.00	59.50	....	58.50	58.00	110
Wyandot, c	25	100,000	1.25	1.13	....	....	....	....	....	....	1.25	....	....	....	150

Official quotations, Boston Stock Exchange. Total sales 150,325 shares.

STOCK QUOTATIONS.

COLORADO SPRINGS, COLO.

NAME OF COMPANY	Par val.	Nov. 4 H.	Nov. 4 L.	*Nov. 5. H.	*Nov. 5. L.	Nov. 6. H.	Nov. 6. L.	Nov. 7. H.	Nov. 7. L.	Nov. 8. H.	Nov. 8. L.	Nov. 9. H.	Nov. 9. L.	Sales
Acacia	$1	.15½	.14½	..	..	.15⅝	.12	.15½	.14⅞	.15¼	.14⅝	.15	.13⅝	1,000
Alamo	1	.14¼	.13½	..	..	.14¼	.13¼	.14	.13¼	.13½	.13¼	.13½	.13¼	7,000
Am. Con...	1	..	..	..	..	..	..	..	..	..	..	..	..	....
Anaconda..	1	.29	.26	..	..	.29	.27½	.27½	.26½	.28	..	.27½	.26	3,500
Anchor ...	1	.02	.01½	..	..	.02	..	.02	..	.02	..	.02	.01⅝	....
Antelope ..	1	.02	..	..	..	.02	..	.02	..	.02	..	.01⅞	..	....
Aola	1	.04½	.04	..	..	.04½	.04	.04¼	04	.03⅞	.03¾	.04	.03¼	27,000
Argent. Jr.	2	.06¼	..	..	..	.07½	.07¼	.08	.07	.08	.06¼	.08	.06	5,527
Banner ...	1	0.11½	.01¼	..	..	.01⅜	..	.01½	.01⅛	..	..	.01	..	....
Battle Mt.C.	1	.19¼	.19	..	..	.19¼	.18¾	.19	.18¾	.19¼	.18¾	.19	.18½	9,000
Black Bell.	1	.10	.09	..	..	.10	.09	.09⅝	08⅞	.09½	.09¼	.09⅝	.08¾	1,000
Blue Bell..	1	..	..	..	..	..	..	..	..	..	..	..	..	....
Buckhorn..	1	.03⅝	.03	..	..	.03¾	..	.03¾	..	.03¾	..	.03¾	..	....
But'fly Ter	1	.34	..	..	..	.32½	..	.32	.15	.32	..	..	..	....
Cadillac....	1	.01⅝	..	..	..	.01¾	.01	.01¾	.01	.01¾	.01	.01¾	.01	....
Cent'l Con.	1	.08¾	..	..	..	.09	.08¾	..	..	.09	.08¾	.08½	..	1,000
Champion..	1	.03¾	.03½	..	..	.03½	..	.03¾	.03½	.04	.03¼	.03¾	.03½	1,000
Chicolo	1	.02	.01½	..	..	.02	.05	.02	..	.02	.01¼	.02	.01¼	3,000
C. K. & N.	1	.02¼	.02	..	..	.02¼	.02	.02¼	.02	.02¼	.02⅛	.02⅜	.02⅛	8,000
C. C. Colum.	1	..	..	..	..	..	..	..	..	..	..	..	..	....
C. C. G. Ext.	1	.08	.07	..	..	.08	.07	.08	.07	.08	.07	.08	.06	7,000
C. C. & Mn.	1	.07½	..	..	..	.07½	..	.07	..	.08	..	.08	..	....
Cr'de & C.C.	1	.05	.04¼	..	..	.08	.04	.06¾	.05	.04	..	.04	..	3,000
C. C. Con..	1	.09¼	.08⅞	..	..	.09½	.09	.09¼	08⅝	.08¾	.08½	.08⅞	.08¾	18,000
Dante	1	.04⅜	..	..	..	.04¾	.04½	.05	.04½	.05	.04⅜	.05	.04⅜	1,000
Dr. Jack Pot	1	.57½	.56	..	..	.55¼	.55	.55½	.55⅝	.56½	.55½	.56⅜	.55½	5,350
Eclipse ...	1	.12	.11⅞	..	..	.11⅞	.11¾	.11⅝	11⅜	.11¾	.11½	.11⅞	.11⅝	27,000
Elkton Con.	1	1.62	1.61½	..	..	1.64	1.63	1.62⅜	1.60	1.60	1.59½	1.59	1.58½	47,574
El Paso G.	1	.80	.79¾	..	..	.80⅞	.80¾	.78¾	78½	.76½	..	.76¾	.76½	47,423
F. Rawlings.	1	.18	.16	..	..	.19	.16	.16	..	.17	.16	.17½	.16	1,000
Findley ...	1	.08⅝	.07¼	..	..	.09	.08	.09	.08¼	.07½	..	.07½	..	1,000
Gold Dollar	1	.17⅜	.17½	..	..	.17⅜	.17¼	.16¾	16⅝	.16¾	.16⅝	.16⅝	.16½	39,800
Gold. Cycle	1	.61	.60	..	..	.61	.60	.61	60½	.60¼	..	.61	..	11,100
Gold. Fleece	1	.37½	..	..	..	.37½	..	.40	..	..	..	.40	..	1,000
Halden, G.	1	.01¾	..	..	..	.01⅜	..	..	..	.02	..	.01⅝	..	....
Ingham Cn.	½	.14	.13½	..	..	.13¾	.13¼	.14½	13¼	.14	.13¼	.13½	.13¼	1,100
Ironclad ..	1	.05	.04⅜	..	..	.05	.04	.05	.04	.05	.04	.05	.04	....
Isabella....	1	.47½	.47	..	..	.46¾	.46	.46½	45	.46	.45½	.45⅜	.45	23,733
Jack Pot..	1	.42	.40	..	..	.42	.41	.40¼	.39½	.42	.39½	.40	..	2,000
Josephine..	1	.01⅜	..	..	..	..	..	..	..	..	..	.01½	..	....
Key West..	1	.01½	.01¼	..	..	.01⅜	.01¼	.01½	.01¼	..	..	.01½	.01	2,000
Lexington..	1	.07¼	.06¾	..	..	.07½	.06⅜	.07	.26⅜	.07	.06½	.07	.06¾	1,000
Magnet R..	1	.02	.01⅝	..	..	.02	.01½	.02	01½	.02	.01⅝	.02	.01¾	....
Margaret..	1	.01½	..	..	..	.01⅜	..	.01½	..	.01¼	..	.02	..	....
Margery...	1	.02	.01½	..	..	.02	.01½	.02	..	..	..	.02	..	....
Midway....	1	.04¼	.04	..	..	.04¼	.03⅝	.04	.03½	.03¾	.03½	.03¾	.03¼	5,000
M. J. T....	1	.01⅞	.01⅝	..	..	.01⅞	.01⅝	.01⅞	01⅝	.01⅞	.01⅝	.02	.01⅝	2,000
Mobile	1	.02⅛	.01⅞	..	..	.02⅜	.02	.02⅜	.02	.02½	.02	.02⅜	.02	1,500
Moll Dwyer	1	.05	.04⅞	..	..	.05	.04⅞	.05	04¾	.05	.04½	.05	.04¾	2,000
Mol. Gibson	1	.15½	..	..	..	.17	.16	.19	.18¼	.20	.19	.20	.19⅝	16,000
Monarch ..	1	.03¾	.03⅜	..	..	..	..	.04	..	.04	..	.03½	.03¼	....
Montreal...	1	.03½	.03	..	..	.03½	.03	.04	.03	.03½	.02½	.03½	.02¾	2,000
Moon A'c'r.	1	.29	.26	..	..	.30	.26	.29	.26	.30	..	.29	.26	1,000
Morn'g Star	1	.04⅝	.04⅜	..	..	.04½	.04¼	.04¼	04	.03¾	.03⅜	.03⅝	.03¾	41,000
National ..	1	.03	.02⅞	..	..	.02⅞	.02⅜	.02¾	.02⅝	.02⅞	.02½	.02⅞	.02½	7,000
Nellie V....	1	.04½	.04⅜	..	..	.04⅝	.04⅜	.05¾	.05½	.05¼	.05	.05	.04¾	40,000
New Haven	1	.06⅜	.05¾	..	..	.06⅜	.05⅝	.06½	05½	.06	.05¾	.06	.05¾	2,000
Olive Brnch	1	.03¼	.03⅛	..	..	.03½	.03¼	.03¼	..	.03⅛	..	.03	..	4,000
Oriole	1	.02	..	..	..	.02	..	.02	.01⅝	02	..	.02	..	....
Orphan	1	.20	..	..	..	.20	.19	.20	..	.20	..	.20	..	1,000
Pelican ...	1	.01	..	..	..	.01	..	.01⅜	..	.02	.01⅛	.01¾	.01⅛	3,000
Pharmacist	1	.07	.06¾	..	..	.07	.06¾	.07	.06¾	.07	.06¼	.07	.06⅞	3,000
Pilgrim ...	1	.04½	..	..	..	.05½	.04½	.05	04½	.05	.04½	.05	.04⅝	3,000
Pinnacle ..	1	0.9½	.08½	..	..	.09½	.08½	.09	08⅜	.09¼	.08½	.08½	..	5,000
Pointer ...	1	.06	.05¾	..	..	.06	.05⅞	.06	05⅞	.06	.05¾	.05⅞	..	17,000
Portland ..	1	3.05	3.01	..	..	3.04	3.01	2.90	..	3.02	2.95	..	..	2,100
Prince* Alb	1	.04¼	.03⅝	..	..	.04¼	.03¾	.03¾	..	.04¼	.03⅞	.04¼	.03⅝	....
Princess ..	1	.02¼	.02	..	..	.03½	.02⅛	.03	.02⅛	.03½	.02½	.03¼	.02¼	5,000
Progress...	1	.04⅜	.04	..	..	.04⅜	.04	.04¼	04	.04¼	.04	.04¼	.03½	5,000
Republic...	1	.04⅜	..	..	..	.04⅜	.04½	.04¾	04½	.04¾	.04½	.05	.04¾	5,000
Rob. Burns.	1	.03½	.03	..	..	.03½	.02⅞	.03	02¾	.03	.02½	.02⅞	.02½	-2,000
Rose Maud	1	.05⅜	.05⅜	..	..	.05½	.05¼	.05¼	05½	.05⅜	.05¼	.05⅝	.05¼	21,000
Rose Nicol.	1	.06½	.06	..	..	.05½	..	.06⅜	05⅝	.06⅜	.05½	.07	.05¼	....
Silver Gold	1	.01	..	..	..	.01	..	.01	..	..	..	..	..	1,000
Uncle Sam.	1	.03	.02	..	..	.03	.02¼	.02⅞	.02¼	.02½	.02	.02	..	....
Vindicator.	1	1.26	1.25½	..	..	1.26¼	1.25½	1.26	.27	1.26	1.25	1.27	1.26	11,110
Va. M.....	1	.04⅞	..	..	..	..	..	.04⅞	..	.04⅞	..	..	..	....
Work	1	.12	.11½	..	..	.11½	..	.12	11½	.12	.11½	.11⅞	.11⅝	1,000

*Holiday. Total sales, 515,817 shares.

Colorado Springs by Telegraph.

NAME OF COMPANY.	Par Val	Nov. 7. H.	Nov. 7. L.	Nov. 8. H.	Nov. 8. L.	Nov. 9. H.	Nov. 9. L.	Nov. 11. H.	Nov. 11. L.	Nov. 12. H.	Nov. 12. L.	Nov. 13. H.	Nov. 13. L.
Acacia	$1	.15⅛	.14⅞	.15¼	.14⅝	.15	.13⅝	.15	.14	.14⅞	.14¼	.14½	.14¼
Alamo	1	.14	.13¼	.13½	.13¼	.13½	.13¼	.13½	.13⅛	.13¼	.13⅛	.13½	.13
Anaconda	1	.27½	.26½	.28	.27	.27½	.26	.28½	.27	.27½	.27	.27	.26
Argentum	1	.08	.07	.08	.06¼	.08	.06	.07½	.07	.07⅝	.07½	.08	.07
Battle Mt.	1	.19¼	.18¾	.19¼	.18¾	.19	.18½	.18¾	.18½	.18¾	.18½	.18½	.18
Butterfly Ter. ...	1	.32	.25	.32	.25	.32	.25	.32	.20	.29	.20	.27	..
Cripple Creek Con	1	.09½	.08⅝	.08¾	.08½	.08⅞	.08¾	.09	.08¾	.08⅞	.08⅝	.09¼	.08¾
Dr. Jack Pot.....	1	.55½	.55⅜	.56½	.55½	.56⅜	.55½	.56½	.55½	.56	.55¾	.55½	.55
El Paso	1	.79	.78½	.76¾	.76½	.76¾	.76½	.78½	.78	.79	.78	.79	.78½
Elkton Con.	1	1.62½	1.60	1.60	1.59½	1.59	1.58½	1.59¾	1.59	1.55	1.54½	1.60	1.59¼
Fanny Rawlings..	1	.20	.16	.17	.16	.17½	.16	.17½	.16	.17½	.16½	.20	.16½
Finley	1	.09	.08¼	.08¾	.07½	.08¼	.07½	.09	.08	.08¾	.08¼	.09	.08
Gold Dollar	1	.16¾	.16⅝	.16¾	.16⅝	.16¾	.16½	.16¼	.16	.15	.14¾	.15¾	.15⅝
Gold King	1	.65	.60	.80	.60	.85	.60	.85	.60	.67	.60	.70	.60
Golden Cycle	1	.63	.60½	.63	.60½	.63	.61	.63	.61½	.63½	.62	.63	.62¾
Golden Fleece ...	1	.40	.35	.40	.35	.40	.35	.40	.35	.40	.35	.40	.35
Hart	1	.07½	.07	.07½	.07	.07½	.07	.07½	.07	.07	.06	.07	.06
Ingham Con.	1	.14	.13¼	.14	.13¼	.13½	.13¼	.14	.13¼	.14	.13¼	.14	.13¼
Isabella	1	.46½	.45	.46	.45½	.45⅝	.45	.44	.43⅝	.42	.41½	.44	.43½
Jack Pot	1	.40¼	.39½	.42	.39½	.42	.40	.42	.40	.41½	.40¼	.41	.39
Keystone	1	.08¾	.08⅜	.08½	.08	.09	.08	.08¼	.07¾	.08	.07¾	.08	.07
Last Dollar	1	.70	.60	.65	.60	.63	.60	.64	.60	.62	.60	.63	.60
Lexington	1	.07	.06¾	.07	.06½	.07	.06¼	.07	.06¾	.06⅞	.06½	.06¾	.06
Mollie Gibson	1	.19	.18⅞	.20	.19	.20	.19⅝	.20	.19⅝	.19½	.15	.18	.15½
Moon Anchor	1	.29	.26	.30	.28	.29	.28	.27	.26¾	.30	.28	.30	.26¾
Nugget	1	.18	.16	.17	.16	.17	.16	.17	.16	.17	.16	.17	.16
Orphan	1	.20	.19	.20	.19	.20	.19	.20	.19	.20	.19	.20	.19
Pharmacist	1	.07	.06¾	.07	.06¼	.07	.06⅞	.06⅞	.06¼	.07	.06½	.07	06½
Pinnacle	1	.09	.08½	.09¼	.08½	.09¾	.08½	.09	.08	.09¼	.08½	.09	.08⅛
Portland	1	3.00	2.90	3.02	2.95	3.02	2.95	3.01	2.90	3.01	2.90	3.05	2.96
Vindicator Con...	1	1.27	1.26	1.26	1.25	1.27	1.26	1.25	1.21	1.26	1.25	1.21½	1.10
Work	1	.13	.12	.12	.11½	.11⅞	.11⅝	.11⅜	.11⅛	.11⅞	.11⅝	.12	.11¾

PHILADELPHIA, PA.

NAME OF COMPANY	Le'ation.	Nov. 7. H.	Nov. 7. L.	Nov. 8. H.	Nov. 8. L.	Nov. 9. H.	Nov. 9. L.	Nov. 11. H.	Nov. 11. L.	Nov. 12 H.	Nov. 12 L.	Nov. 13. H.	Nov. 13. L.	Sales
Am. Alkali....	..	....	....	.63	....	....	....	.63	.50	.50	....	....	....	400
Am. Cement...	..	....	....	6.50	....	6.63	6.50	6.50	....	6.50	....	6.50	....	392
Beth Iron....	Pa.	....	....	....	....	....	....	....	....	....	....	....	....	....
Beth. Steel...	Pa.	....	....	....	....	....	....	....	....	....	....	....	....	....
Cambria Iron.	Pa.	47.75	....	....	....	....	....	47.75	....	47.50	....	47.50	....	167
Cambria Steel	Pa.	26.50	25.50	26.50	26.13	26.50	26.25	26.75	26.38	26.38	26.13	26.50	25.88	9,579
Susq. S. & S.	Pa.	1.88	....	....	....	1.88	....	1.88	....	1.88	1.75	1.88	....	1,385
United Gas I.	Pa.	1.14½	1.13½	1.18½	1.16½	1.18¾	1.18½	1.19	1.18⅝	1.18¾	1.18	1.18	1.17*	5,644

‡Reported by Townsend, Whelen & Co., 309 Walnut St., Philadelphia Total sales 17,567 shares

LONDON.

Nov. 2

NAME OF COMPANY	Country	Authorized Capital.	Par value.	Last dividend. Amt.	Last dividend. Date.	Quotations Buyers.	Quotations Sellers.
			£. s. d.	s. d.		£. s. d.	£. s. d.
Alaska Goldfields, g....	Alaska	£300,000	1 0 0	2 3	Jan., 1901	10 0	15 0
Alaska-Treadwell, g....	Alaska	1,000,000	5 0 0	1 6	Oct., 1901	3 17 6	4 2 6
Anaconda, c. s.....	Montana	6,000,000	5 0 0	8 2	Oct., 1901	7 3 9	7 6 3
Copiapo, cy.....	Chile	200,000	2 0 0	1 6	July, 1900	2 12 6	2 17 6
De Lamar, g., s.....	Idaho	400,000	1 0 0	1 0	May, 1901	5 0	6 3
El Oro, g.....	Mexico	1,000,000	1 0 0	1 3	July, 1901	1 6 3	1 8 9
Enterprise, g.....	British Col.	200,000	1 0 0			13 9	16 3
Frontino & Bolivia, g.	Columbia	140,000	1 0 0	3 0	July, 1901	1 2 6	1 5 0
Hall. Mg.&Sm. c.s.	Brit. Col.	325,000	1 0 0			8 0	9 0
LeRoi, g	Brit. Col.	1,000,000	5 0 0	5 0	Nov., 1899	6 17 6	7 2 6
Le Roi No. 2, g ...	Brit. Col.	120,000	5 0 0	5 0	July, 1901	3 2 6	3 5 0
Lillie, g	Colorado	250,000	1 0 0	2½	Apr., 1900	1 3	3 9
Montana, g., s.....	Montana	660,000	1 0 0	6	Apr., 1899	4 9	5 3
Mountain Copper ...	California	1,250,000	5 0 0	5 0	Oct., 1901	4 0 0	4 5 0
*Stratton's Indp'ence.	Colorado	1,100,000	1 0 0	1 0	Oct., 1901	1 0 0	1 2 6
St. Johh del Rey, g....	Brazil	600,000	1 0 0	1 0	June, 1901	19 6	1 0 6
Utah Con.,g.(High. Boy)	Utah	300,000	1 0 0	5 0	May, 1901	4 10 0	5 0 0
Velvet, g ..British	Columbia	100,000	1 0 0			10 0	12 6
Ymir, g. ..British	Columbia	200,000	1 0 0	1 0	July, 1901	2 2 6	2 5 0
European:							
Linares, l	Spain	45,000	3 0 0	7 0	Mar., 1901	3 10 0	4 10 0
Mason & Barry, c., sul.	Port'g'l	420,000	1 0 0	12 6	May, 1901	3 7 6	3 12 6
Rio Tinto, c	Spain	1,625,000	5 0 0	£1 15s	Nov., 1901	47 7 6	47 12 6
Rio Tinto, pref	Spain	1,625,000	5 0 0	2s 6d	Nov., 1901	6 2 6	6 7 6
Tharsis, c	Spain	1,250,000	2 0 0	12 0	May, 1900	6 0 0	6 5 0
Australia and N. Zealand:							
Assoc. G'ld Mines.	W. Aust'lia	500,000	1 0 0	1 6	Jan., 1900	2 12 6	2 15 0
Br'ken Hill Pr'p.s.	N.S. Wales	384,000	8 0	1 0	Nov., 1901	1 16 6	1 17 6
*Great Bo'd'r Pr'p.	W. Aus'lia	175,000	2 0	6	Sept., 1901	19 3	19 9
H'n'n's Br'nhill, g.	W. Aus'lia	140,000	1 0 0	7 6	Oct., 1900	3 11 3	3 13 9
Ivanh'e Gold C'p.	W. Aus'lia	1,000,000	5 0 0	4 0	Oct., 1901	8 13 9	8 16 3
Kalgurlie, g	W. Australia	120,000	1 0 0	rts.	Oct., 1899	3 8 9	3 11 3
L'ke Vi'w C'ns's, g.	W. Aus'lia	250,000	1 0 0	5 0	Oct., 1901	7 6 3	7 8 9
*Mt. Lyell M. E. R., l., c	Tasmia	900,000	3 0 0	2 6	Oct., 1901	3 18 9	4 1 3
Mt. Morgon, g...	Queensland	1,000,000	1 0 0	6	Nov., 1901	4 10 0	4 15 0
Waihi g	New Zealand	330,000	1 0 0	2 6	Sept., 1901	5 16 3	5 18 9
Indian:							
Champion Reef, g.	Colar Fields	234,169	10 0	4 0	Sept., 1901	5 11 3	5 13 9
Mysore Gold	Colar Fields	265,000	10 0	4 0	Nov., 1901	5 18 9	6 1 3
Nundyroog, g....	Colar Fields	242,000	10 0	1 6	Nov., 1901	2 1 3	2 3 9
Ooregum, g	Colar Fields	290,000	10 0	1 6	Dec., 1901	2 11 3	2 13 9
Ooregum, pref. g.	Colar Fields	240,000	10 0	1 6	Dec., 1901	3 3 9	3 6 3
African:							
Brit'h S. Africa, ch'd.	S. Africa	5,000,000	1 0 0	rts.	May, 1899	2 11 3	2 12 6
Cape Copper	S. Africa	600,000	2 0 0	5 0	July, 1901	4 17 6	5 2 6
Cape Copper, pref.	S. Africa	150,000	2 0 0	5 0	July, 1901	4 15 0	5 0 0
City & Sub'n (New), g.	Transv'l	1,360,000	4 0 0	3 0	Aug., 1899	5 13 9	5 16 3
Con. Deep Level, g.	Transvaal	200,000	1 0 0	10s & bo.	Jan., 1899	15 0	1 0 0
Crown Reef, g.....	Transvaal	120,000	1 0 0	18 0	Nov., 1899	13 17 6	14 2 6
De Beers Con., d.	Cape Colony	3,950,000	5 0 0	£1	Sept., 1901	38 5 0	38 7 6
Ferreira, g	Transvaal	90,000	1 0 0	3 0	Aug., 1899	19 5 0	19 15 0
Geldenhuis Est., g.	Transvaal	200,000	1 0 0	10 0	Aug., 1899	5 15 0	6 0 0
Henry Nourse, g ..	Transvaal	125,000	1 0 0	10 0	Aug., 1899	7 17 6	8 2 6
Jagersfontein, d	Orange F. S.	1,000,000	5 0 0	6 0	Dec., 1900	21 2 6	21 7 6
Joh'n'b'g Con. Invet.	S. Africa	2,750,000	1 0 0	2 0	Nov., 1899	2 1 3	2 2 6
Jubilee, g	Transvaal	50,000	1 0 0	5 0	Aug., 1899	5 7 6	5 12 6
Langlaagte Est., g.	Transvaal	470,000	1 0 0	3 0	Sept., 1899	3 0 0	3 5 0
May Con., g.....	Transvaal	290,000	1 0 0	0 6	Aug., 1899	3 17 6	4 0 0
Meyer & Charlton, g.	Transv'l	100,000	1 0 0	8 0	July, 1899	5 0 0	5 5 0
Namaqua, c ....Cape	Colony	200,000	2 0 0	8 0	June, 1901	4 2 6	4 7 6
Primrose (New), g.	Transvaal	300,000	1 0 0	6 0	Aug., 1899	3 17 6	4 0 0
Rand Mines, g.....	S. Africa	1,795,956	5 0	15 0	Aug., 1899	10 3 9	10 5 0
Robinson, g	Transvaal	2,750,000	5 0 0	8 0	Aug., 1899	9 1 3	9 3 9
Sheba, g	Transvaal	1,100,000	1 0 0	0 6	July, 1899	17 6	18 9
Sim. & Jack Prp., g.	Transvaal	5,000,000	5 0 0	4 0	July, 1899	5 18 9	6 1 3
Wolhuter, g	Transvaal	860,000	4 0 0	2 0	Feb., 1899	3 17 6	4 0 0

c.—Copper. d.—Diamonds. g.—Gold. l.—Lead. s.—Silver. *Ex-dividend.

MEXICO.

Nov. 4

NAME OF COMPANY.	Shares	Last div'd	Prices. Bid.	Prices. Ask.
Durango:				
Ca. Min. de Penoles.	2,500	50.00	3,700	3,900
Augustias, Pozos ...	2,400	5.00	70	75
Guananjuato:				
Cinco Senores y An., aviada	2,000	15.00	220	230
Cinco Senores y An., aviada.	400		170	186
Providencia, San Juan de la Luz.....	6,000	2.00	190	210
Guerrero:				
Garduno y Anexas..	7,200		30	50
Hidalgo:				
Amistad y Concordia.	9,600	1.56	44	45
Carmen, aviada.....	1,100		120	140
Ca. Real del Monte.	2,554		550	750
El Encino, aviador..	1,120		40	50
Guadalupe Fresnillo y Anexas	1,000		200	360
La Blanca, aviada...	1,536		295	305
La Blanco, aviada ..	768		220	240
Maravillas y An., aviador.	1,680		150	
Maravillas el Lobo..	1,000		300	400
Palma y An., aviador.....	1,800		15	25
Sta. Gertrudis y An., aviador, ...	9,600		4	5
Sta. Gertrudis y An., aviador	28,800	0.50	49½	50½
Santo Tomas Apostol aviador	5,100		10	11
San Rafael y An., aviada	1,200	8.00	405	415
San Rafael y An., aviada	1,200	8.00	400	410
Soledad, aviada...	960	5.00	290	300
Sorpressa, aviada ..	960	5.00	285	300

NAME OF COMPANY.	Shares	Last div'd.	Prices Bid.	Prices Ask.
Mexico:				
Alacran	2,400		40	50
La Esperanza (El Oro)	3,000	10.00	795	850
Socavon de S. Fern..	2,500		70	90
Michoacan:				
Luz de Borda, aviador.	3,000		9	11
Luz de Borda, aviada	1,000		7½	10
San Luis Potosi:				
Concepcion y An....	3,000		120	130
El Barreno, aviador.	2,000	2.00	50	52
Sta. Maria de la Paz.	2,400	15.00	585	595
Santa Fe	2,400		20	30
San Diego y Anexas.	2,400	4.00	135	145
Zacatecas:				
Candelaria y Pinos..	2,500		400	420
San Carlos y Anexas.	2,500	15.00	550	560
Sta. Maria de Guad.	2,500		325	330
Miscellaneous:				
Bartolome de Medina	2,000	2.00	35	45
Guadalupe Hacienda.	10,000	2.00	190	200
La Luz Hac. (Pachuca)	6,000		48	52
La Reina (Chihuahua)	192		2,500	3,500
Naica (Chihuahua)..	100		2,450	2,550
Natividad (Oaxaca) aviador	1,800	4.00	400	450
National (Oaxaca) aviador	1,800	4.00	400	500
San Francisco Hac..	6,000	1.00	61	63
Santa Ana Huantla Morelos	4,000		50	70
Union Hacienda	3,000	5.00	150	180

MONTREAL, CANADA.

Nov. 12

NAME OF COMPANY.	Par val.	H.	L.	Sales.
Big. Three.....	$1	.01¼	....	...
California	1	.05	.03	....
Can Gold Fields....	0.10	.05½	.04¾	500
Deer Trail Con....	1	.03¼	.01¾	....
Evening Star.....	1	.04	.01½	....
Golden Star.....	1	....	....	....
Gold Hills Dev.....	1	....	....	....
Knob Hill.....	1	....	....	....
Monte Christo.....	1	.01½	.01¼	....
Montreal G. F....	1	.02	.01¾	....

NAME OF COMPANY.	Par val.	H.	L.	Sales
Montreal-London ...	0.24	.02½	.01¾	....
Noble Five.....	1	....	....	....
Novelty	1	.01	.00¼	....
North Star.....	1	.27	.23½	4,000
Payne	1	.14	.10	2,000
Rambler-Cariboo ...	1	....	....	....
Republic Con.....	1	.03½	.02¼	....
Slocan-Sovereign ..	1	.03½	.01¾	....
Virtue	1	.25	.23	....
War E

CHEMICALS, MINERALS, RARE ELEMENTS, ETC. CURRENT WHOLESALE PRICES.

	Cust.	Meas.	Price.
Abrasives—			
Carborundum, f.o.b. Niagara Falls, Powd., F. FF. FrF.	lb.		$0.08
Grains	"		.10
Corundum, N. C.	"		.07@.10
Chester, Mass.	"		.04½@.05
Crushed Steel, f. o. b. Pittsburg	"		.05½
Emery, Turkish flour, in kegs.	"		.03½
Grains, in kegs	"		.05@.05½
Naxos flour, in kegs	"		.03½
Grains, in kegs	"		.05@.05½
Chester flour, in kegs	"		.03½
Grains, in kegs	"		.05@.05½
Peekskill, f.o.b. Easton, Pa., flour, in kegs	"		.01½
Grains, in kegs	"		.02½
Crude, ex-ship N. Y.: Abbott (Turkey)	lg. ton		26.50@30.00
Afrodissia (Turkey)	"		23.00@24.00
Kuluk (Turkey)	"		22.00@24.00
Naxos (Greek) h. gr	"		26.00
Garnet, as per quality	sh. ton		25.00@35.00
Pumice Stone, Am. powd	lb.		.01@.02
Italian, powdered	"		.01½
Lump, per quality	"		.04@.40
Rottenstone, ground	"		02½@.04½
Lump, per quality	"		.04@.20
Rouge, per quality	"		.10@.30
Steel Emery, f.o.b. Pittsburg	"		.07
Acids—			
Benzoic, English	oz.		.12½
German	lb.		.40
Boracic, crystals	"		.10¼@.11
Powdered	"		.11¼@.11½
Carbolic, crude, 60%	gal.		.27
Cryst, 37½ drums	lb.		.21
Liquid, 95%	gal.		.32
Carbonic, liquid gas	lb.		.12½
Chromic, crude	"		.20
Chem. pure	"		.50
Hydrofluoric, 3%	"		.05
48%	"		.05
Best	"		.25
Sulphurous, liquid anhy	"		.08
Tartaric, cryst	"		.28@.28¼
Powder	"		.28¼@.28¾
Alcohol—Grain	gal.		2.53
Refined wood, 95@97%	"		.60@.65
Purified	"		1.20@1.50
Alum—Lump	100 lbs.		1.75
Ground	"		1.85
Powdered	"		3.00
Chrome, com'l	"		2.75@3.00
Aluminum—			
Nitrate	lb.		1.50
Oxide, com'l, common	"		.03½
Best	"		.20
Pure	"		.80
Hydrated	100 lbs.		2.60
Sulphate, pure	"		1.50@2.00
Com'l	"		1.15@1.25
Ammonia—			
Aqua, 16°	lb.		.03
18°	"		.03½
20°	"		.03¾
26°	"		.05¼
Ammonium—			
Bromide, pure	lb.		.52@.53
Carbonate, lump	"		0.8¼@.08½
Powdered	"		.09@.09¼
Muriate, grain	"		.05¾
Lump	"		.08½
Nitrate, white, pure (99%)	"		.12
Phosphate, com'l	"		.09
Chem., pure	"		.60
Antimony—Glass	"		.30@.40
Needle, lump	"		.05½@.06
Powdered, ordinary	"		.05¾
Best	"		.08¼
Oxide, com'l white, 95%	"		.09½
Com'l white, 99%	"		.12
Com'l gray	"		.07
Sulphuret com'l	"		.16
Arsenic—White	"		.03½@.03¾
Red	"		.07@.07¼
Ashphaltum—			
Ventura, Cal	sh. ton		32.00
Cuban	lb.		.01½@.03½
Egyptian, crude	"		.05½@.06
Trinidad, refined	sh. ton		35.00
San Valentino (Italian)	lg. ton		16.00
Seyssel (French), mastic	sh. ton		21.00
Gilsonite, Utah, ordinary	lb.		.03
Select	"		.03¾
Barium—Carbonate, Lump, 80@90%	sh. ton		25.00@27.50
92@98%	"		26.00@29.00
Powdered, 80@90%	lb.		.01¾@.02
Chloride, com'l	100 lbs.		1.67½@1.76
Chem. pure cryst	lb.		.05
Nitrate, powdered	"		.05½
Oxide, com'l, hyd. cryst	"		.18
Hydrated, pure cryst	"		.25
Pure, powd	"		.27
Sulphate (Blanc Fixe)	"		.02
Barytes—			
Am. Cr. No. 1	sh. ton		9.00
Crude, No. 2	"		8.00
Crude, No. 3	"		7.75
German, gray	"		14.50
Snow white	"		17.00
Bauxite—Ga. or Ala. mines:			
First grade	lg. ton		5.50
Second grade	"		4.75
Bismuth—Subnitrate	lb.		1.40
Subcarbonate	"		1.65
Bitumen—"B"	"		.03½
"A"	"		.03
"A" and "B"	"		.04½
Bone Ash	"		.02¾@.02¾
Borax	"		.07¾@.07½
Calcined	"		.25
Bromine	"		.40

	Cust.	Meas.	Price
Cadmium—Metallic	lb.		1.40
Sulphate	100 lbs.		2.00@2.50
Calcium—Acetate, gray	"		1.25
" brown	"		.95
Carbide, ton lots f.o.b. Niagara Falls, N. Y., or Jersey City, N. J.	sh. ton		75.00
Carbonate, ppt	lb.		.05
Chloride, com'l	100 lbs.		.75
Best	"		.80@1.00
Sulphite	lb.		.05
Cement—			
Portland, Am., 400 lbs	bbl.		1.50@2.00
Foreign	"		1.65@2.25
"Rosendale," 300 lbs	"		.85
Sand cement, 400 lbs	"		1.55@1.95
Slag cement, imported	"		1.65
Ceresine—			
Orange and Yellow	lb.		.12
White	"		.13½
Chalk—Lump, bulk	sh. ton		2.45
Ppt. per quality	lb.		.03¾@.05
Chlorine—Liquid	"		.30
Water	"		.15
Chrome Ore—			
(50% ch.) ex-ship N. Y.	lg. ton		24.75
Sand, f.o.b. Baltimore	"		33.00
Bricks, f.o.b. Pittsburg	M		175.00
Clay, China—Am. com., ex-dock, N. Y.	lg. ton		8.00
Am. best, ex-dock, N. Y.	"		9.00
English, common	"		12.00
Best grade	"		17.00
Fire Clay, ordinary	sh. ton		4.25
Best	"		6.00
Slip Clay	"		5.00
Coal Tar Pitch	gal.		.08
Cobalt—Carbonate	lb.		1.75
Nitrate	"		1.50
Oxide—Black	"		2.26@2.30
Gray	"		2.28@2.40
Smalt, blue ordinary	"		.06
Best	"		.20
Copperas	100 lbs.		.30@.35
Copper—Carbonate	lb.		.18
Chloride	"		.25
Nitrate, crystals	"		.35
Oxide, com'l	"		.19
Cream of Tartar	"		.19¼@.19¾
Cryolite	"		.06¾
Explosives—			
Blasting powder, A	25 lb. keg		2.65
Blasting powder, B	"		1.40
"Rackarock," A	lb.		.25
"Rackarock," B	"		.18
Judson R.R. powder	"		.10
Dynamite (20% nitro-glycerine)	"		.13
(30% nitro-glycerine)	"		.14
(40% nitro-glycerine)	"		.15
(50% nitro-glycerine)	"		.16½
(60% nitro-glycerine)	"		.18
(75% nitro-glycerine)	"		.21
Glycerine for nitro (32 2-10° Be.)	"		.13@.13¼
Feldspar—Ground	sh. ton		8.00@9.00
Flint Pebbles—Danish	met. ton		22.50
Fluorspar—			
Am. lump, 1st grade	sh. ton		14.40
2d grade	"		13.90
Gravel and crushed, 1st gr.	"		13.40
2d grade	"		12.40
Ground, 1st grade	"		17.90
2d grade	"		16.50
Foreign, lump	"		8.00@12.00
Ground	"		11.50@14.00
Fuller's Earth—Lump	100 lbs.		.75
Powdered	"		.85
Refined lump	"		1.25
Graphite—Am. f.o.b. Providence, R. I., lump	sh. ton		8.00
Pulverized	"		30.00
German, som. pulv	lb.		.01¼@.01¾
Best pulverized	"		.01½@.02
Ceylon, common pulv	"		.02¾@.03½
Best pulverized	"		.04@.08
Italian, pulv	"		.01¼
Gypsum—Ground	sh. ton		8.00@8.50
Fertilizer	"		7.00
Rock	lg. ton		4.00
English and French	"		14.00@16.00
Infusiorial Earth—Ground.			
American, best	"		20.00
French	"		37.50
German	"		40.00
Iodine—Crude	100 lbs.		2.45
Iron—Muriate	lb.		.05
Nitrate, com'l	"		.01¼
True	"		.04
Oxide, pure copperas col	"		.05@.10
Purple-brown	"		.02
Venetian red	"		.01@.01½
Scale	"		.01@03
Kaolin—(See Clay. China.)			
Kryolith—(See Cryolite.)			
Lead—Acetate, white	lb.		.07¾@.08
Brown	"		.03
Nitrate, com'l	"		.06½
" gran	"		.08¼
Lime—Com., ab. 250 lbs	bbl.		.70
Finishing	"		.90
Magnesite—Greece.			
Crude (95%)	lg. ton		6.50@7.00
Calcined	sh. ton		14.00@15.00
Bricks	M		170.00
Am. Bricks, f.o.b. Pittsburg	"		175.00
Magnesium—			
Carbonate, light, fine pd	lb.		.04½
Blocks	"		.00@.07
Chloride, com'l	"		.01¾
Fused	"		.20
Nitrate	"		.60
Sulphate	100 lbs.		.75@.95
Manganese—Powdered, 70@75% binoxide	lb.		.01¼@.01½

	Cust.	Meas.	Price
Manganese—Crude, pow'd.			
75@85% binoxide	"		.01½@.02¼
85@90% binoxide	"		.02¼@.03¼
90@95% binoxide	"		.03¼@.05½
Carbonate	"		.16@.20
Chloride	"		.04
Ore, 50%, Foreign	unit		.23@.24
Domestic	"		.30
Marble—Flour	sh. ton		6.00@7.00
Mercury—Bichloride	lb.		.77
Mica—N. Y. gr'nd, coarse	"		.03@.04
Fine	"		.04@.05
Sheets, N. C., 2x4 in.	"		.30
3x3 in.	"		.80
3x4 in.	"		1.50
4x4 in.	"		2.00
6x6 in.	"		3.00
Scrap, f.o.b. Dillsboro, N. C.	sh. ton		25.00
Mineral Wool—			
Slag, ordinary	sh. ton		19.00
Selected	"		25.00
Rock, ordinary	"		32.00
Selected	"		40.00
Monazite—92%	"		140.00
Nickel—Oxide, No. 1	lb.		1.00
No. 2	"		.60
Sulphate	"		.20@.21
Oils—Black, reduced 29 gr.:			
25@30, cold test	gal.		.09¾@.10¼
15, cold test	"		.10¾@.11¼
Zero	"		.11¾@.12¾
Summer	"		.09¼@.09¾
Cylinder, dark steam ref	"		.08¾@.10¾
Dark, filtered	"		.11¼@.15¾
Light filtered	"		.14¾@.17¾
Extra cold test	"		.21¾@.26¾
Gasoline, 86°@90°	"		.14@.19
Naphtha, crude, 68°@72°	bbl.		9.05
"Stove"	gal.		.12
Linseed, domestic raw	"		.60@.65
Boiled	"		.67
Calcutta, raw	"		.85
Ozokerite	lb.		.11½
Paints and Colors—			
Chrome green, common	"		.05
Pure	"		.16
Yellow, common	"		.10¾
Best	"		.25
Lampblack, com'l	"		.04½
Refined	"		.07
Litharge, Am. powd	"		.04¾@.05¼
English flake	"		.08¼
Glassmakers'	"		.08
Metallic, brown	sh. ton		19.00
Red	"		16.50
Ocher, Am. common	"		9.25@10.00
Best	"		21.25@25.00
Dutch, washed	lb.		.04¾
French, washed	"		.01¼@.02
Orange mineral, Am	"		.08@.08¼
Foreign, as to make	"		.08¼@.11½
Paris green, pure, bulk	"		.12½
Red lead, American	"		.05¾
Foreign	"		.07½@.08¼
Shellac, "D. C."	"		.34
Native	"		.22
Turpentine, spirits	gal.		.38
Ultramarine, best	lb.		.25
Vermilion, Amer. lead	"		.10@.14
Quicksilver, bulk	"		.70
Foreign	"		.80@.85
White lead, Am., dry	"		.04¾@.05
American, in oil	"		.05¾
Foreign, in oil	"		.07½@.09¼
Whiting, common	100 lbs.		.40
Gilders	"		.45½
Zinc, white, Am., ex dry	lb.		.04¾@.04¾
American, red seal	"		.06½
Green seal	"		.07
Foreign, red seal, dry	"		.03½@.08⅝
Green seal, dry	"		.07¾@.09⅞
Potash—			
Caustic, ordinary	"		.04½@.06
Elect. (90%)	"		.06½
Potassium—			
Bicarbonate cryst	"		.08¼
Powdered or gran	"		.14
Bichromate, Am	"		.08¼
Scotch	"		.08½@.09
Carbonate, hydrated	"		.04@.04¼
Calcined	"		.03½@.03¾
Chromate	"		.35
Cyanide (98@99%)	"		.24@.25
Iodide, bulk	"		2.05
Kainit	lg. ton		9.05
Manure salt, 20%	100 lbs.		.66
Double Manure salt, 48@53%	"		1.12
Muriate, 80@85%	"		1.83
95%	"		1.86
Permanganate, pure cr	lb.		.12¾@.13¾
Prussiate, yellow	"		.13½
Red	"		.37@.37¾
Silicate	"		.06
Sulphate, 90%	100 lbs.		2.11
96%	"		2.14
Sulphide, com'l	lb.		.10
Sylvinit	unit		.39½
Quartz—(See Silica).			
Rosin—			
Com. strained (280 lbs.)	bbl.		1.45
Best	"		4.10
Salt—N. Y. com. fine	sh. ton		2.00
N. Y. agricultural	"		1.50
Saltpetre—Crude	100 lbs.		3.40@3.45
Refined	"		4.25
Silica—Best foreign	lg. ton		10.00@11.00
Ground quartz, ord	sh. ton		6.00@8.00
Best	"		12.00@13.00
Lump quartz	"		2.50@4.00
Glass sand	"		2.75
Silicon—Carbide	lb.		.05
Silver—Chloride	oz.		.65
Nitrate	"		39½
Oxide	"		85.@1.10
Slate—Ground, black	sh. ton		7.50@8.75
Ground, red and olive	"		20.00

	Cust.	Meas.	Price
Sodium—Acetate, com'l	lb.		.04
Bichromate	"		.06¾
Chlorate, com'l	"		.08¼@.08¾
Hyposulphite, Am	100 lbs.		1.60@1.65
German	"		1.70@1.90
Nitrate, 96@98%	lb.		.08
Peroxide	"		.45
Phosphate	"		.02¼
Prussiate	"		.10½
Silicate, conc	"		.05
Com'l	"		.01
Sulphate, com'l	100 lb.		.77½
Sulphide	lb.		.01¾
Sulphite crystals	"		.02¼
Tungstate, com'l	"		.35
Strontium—Nitrate	"		.06¾@.07
Sulphur—Roll	100 lbs.		1.85
Flour	"		1.90
Flowers, sublimed	"		2.15
Talc—N. C., 1st grade	sh. ton		13.75
N. Y., Fibrous, best	"		10.20
French, best	100 lbs.		1.25
Italian, best	"		1.62½
Tar—Regular	bbl.		1.90
Oil barrels	"		4.00
Tin—Bichloride, 50%	lb.		.08@.09
Crystals	"		.20@.21¼
Muriate, 36°	"		.09
52°	"		.15
Oxide	"		.40
Uranium—Oxide	"		2.25@3.00
Zinc—Metallic, ch. pure	"		.07@.09¾
Carbonate	"		.15
Chloride	"		.05
Dust	"		.05¾@.05¾
Sulphate	"		.02½@.02¾

THE RARE ELEMENTS.

Prices given are at makers' works in Germany, unless otherwise noted.

	Cust.	Meas.	Price.
Barium—Amalgam	grm		$1.19
Electrol	"		5.71
Boron—Amorphous, pure	"		.19
Chrystals, pure	"		1.43
Nitrate (N. Y.)	lb.		1.50
Cadmium—Sticks	kg.		1.55
Sheets	"		2.83
Granulated	"		1.79
Powder	"		1.19@1.79
Calcium—Elect	grm.		4.28
Tungstate (Scheelite), N. Y.	lb.		.40
Cerium—Fused	grm.		2.02
Nitrate (N. Y.)	lb.		11.00
Chromium—Fused, Elect	kg.		5.95
Pure powder, 95%	"		1.55
Chem. pure cryst	grm.		.20
Colbalt—(98@99%)	kg.		7.26@9.52
Pure			30.94
Didymium—Powd	grm.		3.81
Fused, Elect	"		5.47
Nitrate (N. Y.)	lb.		35.00
Erbium	grm.		3.09
Nitrate (N. Y.)	lb.		40.00
Germanium—Powder	grm.		33.32
Fused	"		35.70
Glucinum—Powder	"		5.95
Crystals	"		9.04
Balls, fused	"		35.70
Nitrate (N. Y.)	lb.		20.00
Indium	grm.		3.57
Iridium—Fused	"		1.07
Powder	"		.95
Lanthanum—Powder	"		4.28
Electrol, in balls	"		9.04
Nitrate (N. Y.)	lb.		30.00
Lithium	grm.		2.38
Nitrate (N. Y.)	oz.		.60
Magnesium—Ingot	kg.		6.43
Powdered	"		5.47@7.14
Ribbon	"		9.99
Sheet	"		9.04
Wire	"		9.52
Manganese—Fu'd com'l.	"		1.31@1.43
Fused, pure	"		3.81
Molybdenum—Fused powder	grm.		.07
Chem. pure	kg.		17.85
Powder, 95%	"		2.62
Niobium	grm.		3.81
Osium	"		.95
Palladium—Wire	"		.86
Sponge	"		.62
Potassium—In balls	kg.		17.85
Rhodium	grm.		2.28
Rubidnum—Pure	"		4.76
Ruthenium—Powder	"		2.38
Rutile—Crude	kg.		.49
Selinium—Com'l Powder	"		28.18
Sublime powder	"		35.70
Sticks	"		28.56
Silicium—Fused, pure	"		14.28
Chem. pure crystals	"		47.60
Amorphous	"		23.80
Strontium—Electrol	grm.		6.19
Tantalium—Pure	"		3.57
Tellurium—Ch. p. stic s	kg.		107.10
Chem. pure powder	"		83.30
Tallium	"		28.18
Thorium—Nitrate 49@50% (N. Y.)	lb.		5.00
Titanium—Pure	kg.		19.04
Chem. pure	"		47.60
Uranium	"		190.40
Nitrate (N. Y.)	oz.		.25
Vandanium	grm.		1.19
Wolfram—Fused, elect	kg.		238.00
Powder, 95@98%	"		.95
Chem. pure powder	"		6.43
Yttrium	grm.		3.33
Nitrate (N. Y.)	lb.		40.00
Zirconium—Com'l	kg.		35.20
Nitrate (N. Y.)	lb.		8.00

NOTE.—These quotations are for wholesale lots in New York unless otherwise specified, and are generally subject to the usual trade discounts. Readers of the ENGINEERING AND MINING JOURNAL are requested to report any corrections needed, or to suggest additions which they may consider advisable. See also Market Reviews.